EMERGING KNOWLEDGE MANAGEMENT PERFORMANCE MEASURES FOR CONSULTING FIRMS

ABSTRACT

of the Thesis submitted for the award of the degree of
DOCTORATE IN BUSINESS ADMINISTRATION

BY

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Background

There is a high level of interest in Knowledge Management (KM) amongst consulting firms as knowledge is their core asset and the consulting firms consider KM to be a core capability for achieving competitive advantage. Large consulting firms have been increasing their expenditure on information technology and communications infrastructure, developing Intranets and data warehouses, and using Internet to create their knowledge management systems. Global consulting companies like McKinsey, Accenture, Ernst & Young, KPMG, PriceWaterhouseCoopers, etc. as well as Indian companies like Infosys, Tata Consultancy Services, Wipro Technologies, etc. have all been investing heavily in their KM systems – even though they have adopted different approaches to manage knowledge. As examples, Ernst & Young spends about 6 percent of its revenue on KM and McKinsey spends about 10 percent. *However despite the pervasiveness of the view that KM is a core component of competitiveness for consulting companies, its performance evaluation for its effectiveness, is still difficult to determine.*

Relevance/ contribution of the present research

On the measurement and evaluation of KM's impact, one key researcher on KM (Tiwana 2000) reports that despite their research on several companies that have been successful in implementing KM, he has "*yet to come across one that has a strong measurement program in place.*" Some companies like Buckman Laboratories, Canon, Skandia and Dow Chemical have begun to measure their Intellectual Capital (IC), with the belief that growth on this front is often a good indicator of future performance. Though measuring IC is a growing area of interest in KM field and metrics are being developed and applied by some of these firms, there has been a felt need for more research. A more representative framework of KM performance measures – specifically for knowledge-focussed organisations like consulting firms needed to be evolved.

Much of the existing literature on IC measurement stems from the traditional measures based on financial and accounting perspective. Traditional measurements like Return on Investment (ROI), Revenue growth, *Tobin's q* etc. typically look at organisational knowledge as a 'static' asset in an organisation. These provide a snapshot of the firm's

state of intellectual health at a given point of time, but provide no direction for KM strategy development. No specific guidance can be derived out of the traditional financial measures to exploit the dynamic role of KM - if integrated with business strategy - because this involves assessment and monitoring of various other non-financial measures. The traditional financial/accounting measures of performance worked well for the industrial era, but now the system for measurement requires to be reformulated for the knowledge-based organisations. New 'intangibles' like customer satisfaction, employee satisfaction, availability of knowledge-sharing/ dissemination mechanisms, clarity of company's vision, CEO's leadership, competency mapping mechanisms, etc. assume particular importance for consulting firms whose survival and competitive advantage now depends on the how effectively these intangible assets are leveraged and evaluated.

The current research attempted to address the above limitations of traditional performance measures by examining the possible alternative measures of performance for consulting firms. Certain new metrics for measuring quantitative *as well as qualitative* indicators - including those from market/customer related, human/competency development, corporate leadership/strategy/KM practices and technology domains - have been proposed. ***The specific contribution of the research is by attempting to construct an integrated framework of KM based performance measures for consulting firms,*** which can be implemented straightaway – particularly by IT consulting firms.

Research Boundaries and Objectives

The survey of existing literature as well as the secondary data on KM practices revealed that there are, as yet, no perfect metrics for knowledge work. Moreover, it is rarely possible to directly adopt a firm's performance metrics from one sector of economy (for example, petroleum refining) to another firm from a different sector (for example, IT consulting) because differences exist between various sectors of business operations and even between similar firms within a sector. In view of this inherent limitation of the KM field, this ***research was bounded in scope only to consulting firms*** – being *knowledge-focussed* in operation. Also, the investigations involving questionnaire design,

interviews/experience-survey and case studies were confined to organisations ***based in India***, so that the above objectives of research could be successfully achieved - with concrete recommendations for application - within the time horizon of this research.

The research aimed at moving beyond the conventional static measures of performance into a dynamic broad-based approach of performance measurement focussed on consulting firms. This involved broadening the context of KM performance measurement by investigating the significance of certain softer qualitative indicators along with hard quantitative financial measures - like ROI - used so far traditionally.

The objectives of the research included:

1. To examine the possible alternative measures of performance for consulting firms.
2. To propose certain new, innovative metrics for measuring quantitative *as well as qualitative* indicators including those from market/customer related, human/competency development, corporate leadership/strategy/KM practices and technology domains.
3. To evolve an integrated *framework* of KM based performance evaluation measures for such consulting firms, and
4. To validate the concept and structure of the evolved framework through illustrative case studies.

Literature Review

Since the KM field itself is of recent origin, not much of research literature was available on modelling for KM performance measures - particularly for consulting firms. As the starting stage of research process, *three streams of KM literature – KM concepts, KM application in consulting organisations, and KM performance measurement* – were reviewed. The first stream of literature examined helped in demystifying the buzz around KM and clarifying its basic concepts. The clear distinction between IT Management and KM brought out in the literature focusses on KM as the set of *business processes* - rather than on the tools and technologies of IT

domain. The implementation methodology for KM and associated managerial challenges brought out in the literature set the context for KM assessment and performance measurement as an ongoing activity. The review of literature on learning organisations – including the framework of "3 Ms" (Meaning, Managing and Measurement) - was useful for bringing home the intrinsic characteristics of consulting firms (for ensuring survival and growth, consulting firms have to have the characteristics of learning organisations) and the importance of performance measurement and associated metrics.

Regarding the second stream of reviewed literature, it was observed that there is glaring inadequacy of published literature on KM applications in consulting companies – and more severely so for KM performance measurement in consulting firms. (The publications of trade associations and apex bodies like Consultancy Development Centre (CDC) and NASSCOM also were not of direct help in this specific stream of literature). Since the KM field itself is of recent origin, not much of research literature is available on KM applications. Within the innovative companies who have adopted KM as a systematic and formal business process, consulting companies are of course, the leaders. But perhaps the initial apprehensions about the long term KM effectiveness and the competitive trade pressures, have been the strong inhibitors for these companies for making public their approaches and practices about KM. Nevertheless, the conceptual classification of KM strategies for consulting companies given by Hansen, et al. and some other "guidelines" provided by other authors like Botkin and Dunford have a useful relevance to the present study. Other literature just reemphasises the seriousness and the need for more research in the area of KM performance evaluation.

Finally, the last portion of literature study provided the "state-of-the-art" on the subject of KM performance evaluation. An appreciation of the drawbacks of the existing traditional measures of IC/ KM strengthened the need for more research into the subject. Outlining of some current research works has brought home the fact that despite some scattered, but appreciable efforts in that direction, as yet no effective

framework of KM performance measures has been developed which can be used as a guide by the consulting organisations.

The literature reviewed in this section helped in showing the 'broad direction' for proceeding further. The benchmarking and balanced scorecard techniques have been useful at a conceptual level for providing an understanding of the need for an integrative mechanism for various possible disparate measures of KM. The stakeholder viewpoint for performance measures is another useful insight given by the literature. However, broadly speaking, other than getting an understanding of some useful KM concepts, identification of research gap in KM performance assessment, and picking up some constituent elements of performance measures suggested by some scholars for further examination, the present collection of available published literature has not been of substantive help for the present study. This rather inadequate 'state-of-the-art' on KM performance evaluation is understandable because the KM field itself is of recent origin and very few researchers have reached that level of depth to appreciate the importance of measures for KM effectiveness.

Outline of Research Methodology

After extensive survey of available literature and secondary information, the first stage of research began as exploratory, and in the course of exploratory investigations and fieldwork, a conceptual "Framework" of KM performance measures was developed. In the second stage, the research moved to prescriptive phase. This required statistical tests of significance on all candidate measures to arrive at the 'top 12' KM measures for various data sub-sets forming the contents of the KM performance framework, followed by illustrative validation of the framework through some case studies. The insights gathered through the illustrative case study validation stage were incorporated into the finally recommended framework after detailed analysis and interpretation.

The two major stages of research process followed are:

Stage1: Development of the Conceptual Framework

1. Library research
2. Design of Questionnaire/ Interview Schedule for Primary Data Collection
3. Collection of Primary Data through Questionnaire/ Interview Schedule

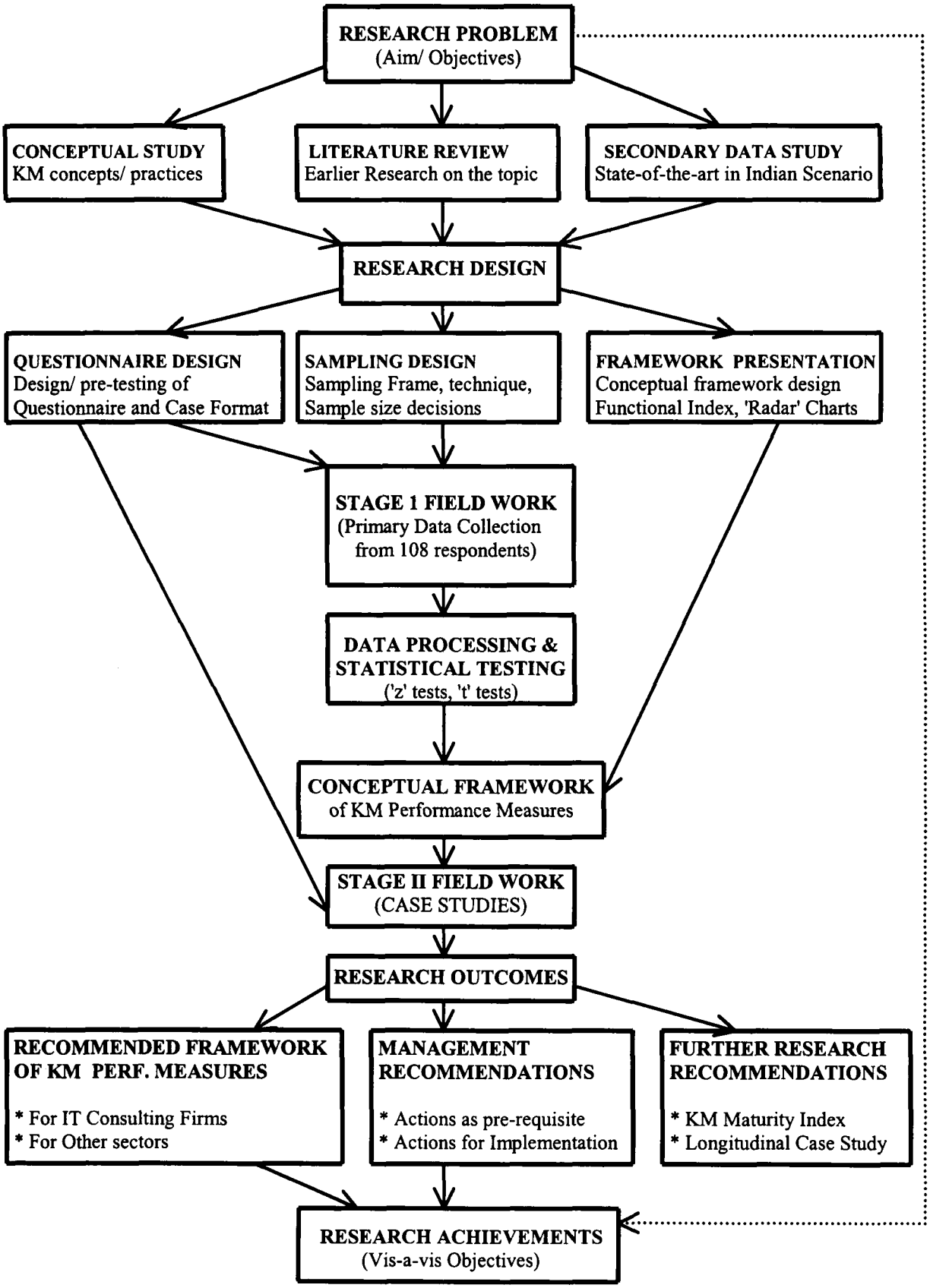
Stage II: Statistical Testing and Illustrative Validation of Framework through Case Studies

1. Statistical testing
2. Illustrative Case Studies

The "Research Process Flow Chart" on the next page explains in more detail each stage of the research process/ methodology -- starting from formulation of research problem to evaluation of research achievements.

Data Analysis and Interpretation

The statistical analysis of the primary data collected at the field at Stage I of the research led to the construction of the "Framework of KM Performance Measures". The 'core data' analysed was the 'perception' of 108 respondents about 'Importance' and 'Ease of Measurement/ Assessment' on a 4-point scale - for each of the 47 factors listed in the questionnaire. Table in the following pages gives the ranked list of all 47 factors with associated ratings on ease of measurement/ assessment. This ranked list of important measures of KM performance arrived at after the primary data analysis formed the premise for the recommended "Framework of KM Performance Measures".



RESEARCH PROCESS FLOWCHART

Table : Ranked List of All Measures (For Whole Sample)

Factor	Ease of measurement	Importance Rank
• Customer satisfaction	2	1
• CEO's personality/ leadership style	3	2
• Return on Investment ROI (%)	4	3
• Employee satisfaction	2	4
• Availability of a knowledge sharing/ dissemination mechanism	2	5
• Availability of company's stated 'Vision'	3	6
• Availability of a Quality Management systems/practices documentation	3	7
• Image	2	8
• Reuse rate of existing knowledge/ best practices (%)	2	9
• KM integration with strategy	2	10
• Annual revenue growth (%)	4	11
• New orders (No.)	4	12
• Availability of company wide collaborative/messaging/workflow tools	3	13
• IT investments (Rs.)	4	14
• Ratio of repeat customers to total (Ratio)	4	15
• R&D investments /revenue (Ratio)	3	16
• Availability of a competency mapping mechanism	2	17
• Market share (%)	4	18
• Availability of an employee experience recording mechanism	3	19
• New ideas of employees implemented (No.)	2	20
• Employee Value Added EVA (Rs.)	2	21
• Communications investments (Rs.)	4	22
• Certifications by industry/standards bodies	4	23
• Success ratio for new bids (Ratio)	3	24
• Training on KM practices (Days)	4	25
• Time saved in creating new proposals	2	26
• Av. amount of rework/rejects (%)	2	27
• Industry accreditation	3	28
• Av. training imparted per year (Days)	4	29
• Av. experience of employees (Years)	4	30
• Training/ competence development spending : Av. per employee (Rs.)	4	31
• Duration of KM functioning (Years)	3	32
• Staff dedicated for KM function (No.)	4	33
• Av. orders per customer (No.)	4	34
• Time spent on project closing reports	3	35
• No. of executive levels in hierarchy	4	36
• Patents held & pending (No.)	4	37
• Duration of Web-based functioning (Years)	4	38
• Av. expenses per unsuccessful bid (Rs.)	2	39
• No. of direct reports to CEO	4	40
• Total papers published per year (No.)	4	41
• Library investment per employee (Rs.)	4	42
• Total no. of invited talks per year (No.)	4	43

•	Seminars organised by company (No.)	4	**44**
•	Av. age of employees (Years)	4	**45**
•	Tobin's Q (Ratio of market value of firm over cost of replacing physical assets)	2	**46**
•	Average age of patents held (Years)	4	**47**

The Framework of KM performance measures proposed in this research is based on the "Top 12" measures from the above Table.

The structure/ presentation format of the recommended framework involves computation of an aggregate functional index KMPI (Knowledge Management Performance Index) and also pictorial presentations in 'radar charts' or 'bar charts' for KMI (Knowledge Management Intensity) and KMP (Knowledge Management Performance) values for any company.

The ranked list of KM measures arrived as explained above pertained to full data set of 108 responses across all sectors of consulting business and covering firms in private sector and public sector, including firms with MNC parents. The sampled data set of 108 firms included firms already having a KM system (with, or without a KM performance review mechanism), as well as firms not having a formal KM system in place. Thus while the full sample represented comprehensively the consulting firms domain as a whole, a need was felt to investigate any differences in KM measures between various sub-sets of whole data. Various data sub-sets were formed from the whole data set of 108 respondents from 57 organisations and the corresponding outcomes of comparative analysis of various possible pairs of data sub-set were arrived at. Observations were made on the comparison of the status of KM practice and review mechanisms, area of consulting operation and Indian vs. MNC firms. The data subsets so formed were then subjected to similar statistical significance analysis for arriving at 'top 12' measures in each case.

It is revealing that for the consulting domain as a whole as well as for the IT consulting sector, the list of top 12 KM measures is common and hence the proposed framework can

be confidently implemented straightaway for IT consulting firms. The research has also revealed that *just one financial measure (ROI) gets included among the top 12 measures for KM performance, the rest all belong to 'non-financial' categories.* ***Customer Satisfaction is the top-most measure of KM performance for the consulting domain as a whole, as well as for IT consulting sector***. Other commonly important measures of KM performance across major categories of data sub-sets are Employee Satisfaction and CEO's Personality/Leadership. So now for some reasons, if the management wants to pick just one factor for improved focus on KM, it knows which factor to choose. *It's not ROI – as was traditionally considered – but it is the Customer Satisfaction.* The consequent action to be initiated by management in this case is to put in place a mechanism for measuring/ assessment of customer satisfaction on a measurable scale.

The structure of the recommended framework – as functional index KMPI, as well as KMP and KMI 'radar chart' presentations -has been discussed in the thesis, using the comparison of 4 firms as 'case studies' for illustration. Background information about two case firms studied in detail is also given.

The optional/ unstructured responses obtained at the data collection stage were also discussed and observations made on their significance and relevance. This unstructured information studied was by way of the respondents' feedback on the review mechanism of KM systems in their firms and also some suggestions for 'factors' to be considered additionally as candidates measures of KM performance.

Though further research studies may be desirable for identification of top 12 measures separately for each other sector – say, management consulting, engineering projects consulting, etc. - pending that, the same framework can also be applied for any consulting firm from any sector. This is because the top 12 measures incorporated in the proposed framework are the same for consulting domain as a whole as for IT consulting sector, which has already displayed 'maturity' of business performance at global level. So, as a starting stage, the same list of top 12 KM measures can be deployed for any consulting firm, in the conceptual framework of KM measures proposed.

Achievement of Research Aims/Objectives

This research had aimed at evolving a broad-based approach of performance measurement focussed on knowledge-based organisations like consulting firms. This involved broadening the context of KM performance measurement by investigating the significance of certain non-financial 'qualitative' measures along with the traditional hard 'quantitative' financial measures like Return on Investment.

The objectives of the research and corresponding achievements of this research study against each objective, are given below:

Objective 1:

To examine the possible alternative measures of performance for consulting firms.

Achievement:

Extensive literature study was done on the related work, prior to the design of the primary data collection questionnaire/ interview schedule. As the outcome of the literature research and the study of secondary data sources, as many as 74 possible measures of performance for consulting firms were examined at the stage of design of the field data collection questionnaire.

Objective 2:

To propose certain new, innovative metrics for measuring quantitative as well as qualitative indicators including those from market/customer related, human/competency development, corporate leadership/strategy/KM practices and technology domains.

Achievement:

The original collection of 74 possible alternative measures formed the basic inputs for final design of the questionnaire, through a really insightful 'experience survey' process using the expertise and knowledge of 6 key professionals – as the pre-test exercise. This resulted in identifying 47 measures out of the original 74, for inclusion in the field questionnaire. So in the field survey, the questionnaire/ interview schedule had proposed

various new innovative metrics - financial as well as non-financial – as the candidate measures of KM performance in consulting companies. As many as 44 proposed metrics were non- financial, belonging to the categories of market/ customer, human/competency related, corporate leadership/strategy/practices and technological domain. Thus, the respondents at the field research stage had a range of innovative and new metrics before them, to think over and give their responses.

Objective 3:

To evolve an integrated framework of KM based performance evaluation measures for such consulting firms

Achievement:

The thesis has discussed the construction of the recommended framework of KM performance measures for the consulting firms. The structure of the proposed framework - by way of a functional index KMPI as well as pictorial presentation in the 'radar chart' format – was also presented. This structure is based on integrated assessment of KM performance for the company on 'top 12' KM measures evolved through the statistical analysis of the primary data. The functional presentation of the evolved framework involves computation of the values of Knowledge Management Performance (KMP) and Knowledge Management Intensity (KMI), based on the relative values of all top 12 measures. Likewise, the KMP and KMI charts also depict pictorially all the 12 important measures in an integrated presentation.

Objective 4:

To validate the concept and structure of the evolved framework through illustrative case studies.

Achievement:

The concept validation of the framework was done with 4 consulting firms based in India. The comparative observations on relevant aspects are discussed for all 4 firms in Chapter 5. In addition, detailed narration and in-depth analysis is done for 2 firms – as the

'study of the contrast' as given in an appendix of the thesis. The KMPI values for the case firms computed through the recommended framework validate the concept, if compared relatively. The structure of the framework – as the functional index KMPI, as well as the radar charts – was well appreciated by all the case firms studied. They indicated the ***ease of understanding and implementation*** as the strong point of the recommended framework.

Recommendations for Implementation of the Framework

In order to make the research useful to management of consulting firms, actionable recommendations are presented below. These relate to the actions recommended as pre-requisite for the implementation of the proposed framework, as well as the on-going actions to be taken by management for keeping up the effectiveness of the framework after implementation.

Actions Recommended As the Pre-requisite:

The recommended framework of KM performance measures is based on 'top 12' measures. 9 of these 12 factors are not accurately measurable or easily quantifiable, but have been identified in the field survey as very important. Even within these 9 factors, the ease of accurate assessment/ measurement is different. These 9 measures are given below in the descending order of their importance.

- Customer satisfaction
- CEO's personality/ leadership style
- Employee satisfaction
- Availability of a knowledge sharing/ dissemination mechanism
- Availability of company's stated 'vision'
- Availability of a Quality Management systems/ practices documentation
- Company's Image
- Reuse rate of existing knowledge/ best practices
- KM integration with strategy

Despite the inherent difficulty for accurate assessment of the above 'qualitative' factors, successful and leading companies in consulting sector have already installed some mechanisms for assessment/ quantification of above measures. For example, the illustrative case firms Tata Consultancy Services has put in operation a system for annual assessment of employee satisfaction on a measure Employee Satisfaction Index (ESI). Monitoring of such measures becomes more effective if the firms adopt formal mechanisms for assessments of these 'qualitative' factors.

Apart from the company's own efforts, independent third party agencies like trade associations, federations, independent business research groups and trade media can also play important role for coming out with periodic assessment / rating of various member firms on above measures. For example Dataquest – IDC India annual surveys have become commonly accepted 'benchmarks' on some of these measures like customer satisfaction, employee satisfaction etc. for IT consulting/ software sector. NASSCOM, the apex body and umbrella organisation of the IT companies in India can play an important role for relative benchmarking/ assessment of their member firms, on above measures.

So as a prerequisite, the consulting firms have to put in place mechanisms for assessment/ quantification of the above measures to aid them in comparing their performance with the benchmarks. Wherever the managements feel, help of external organisations like NASSCOM, MAIT, etc can be taken for evolution of such mechanisms. In respect of firms from non-IT consulting, apex associations like Consultancy Development Centre (CDC) can be requested to assist. Other third party agencies like All India Management Association (AIMA), Business India Group, The Economic Times Research Bureau, etc can also be enlisted for such exercise.

With the above management recommendation, the consulting firms will be on a sound footing for actual implementation of the proposed framework.

Actions Recommended for Implementation:

After having established mechanisms for reasonably accurate assessment of the top 12 KM performance measures, the consulting firms have to decide on *two things* - a reference base for determination of its KMI value, and another benchmark for determination of KMP value.

For determination of Knowledge Management Intensity (KMI), the importance perception of the firm for each of the 12-KM measures is determined with reference to a base of comparison. This base can be consulting domain as a whole or the particular sector/ area of the firms operation. The framework presently recommended can be used directly for all IT consulting firms, as far as reference base is concerned. For firms in non- IT sectors too, the present framework provides the reference base for the consulting domain as a whole. However it is recommended that the reference base values should be decided for different consulting sectors like management consulting, engineering project consulting etc. This exercise is recommended to be done with the help of external agencies like CDC, AIMA, Business India, The Economic Times Research Bureau or specialised trade associations for the sector of firm's operation.

Similarly, for determination of Knowledge Management Performance (KMP), the benchmark has to be decided by the company for comparison of its performance on 12 KM measures. For the illustrative case studies, the recommended framework used the benchmark as the company's own performance in previous periods. Though this benchmark serves useful purpose, it is recommended that the firms should put in place an effective " intelligence mechanism" for collecting the corresponding data on the key competitors and other associated organisations for monitoring its related performance with reference to the competition.

Finally, it is recommended that after successful working of the framework for 2-3 years, a review of the contents (list of which measures to be included for computation of KMPI value) is required - with reference to the base of KMI and also the benchmark decided for

KMP. *With time there is a necessity for on-going review of the 'contents', although the 'concept' and 'structure' of the recommended framework will remain the same.*

Limitations of This Research

For the consulting firms, knowledge management can be a defining feature of their business and a serious competitive weapon. By virtue of the nature of their business, these firms see the capacity to compete on the basis of their accumulated knowledge and expertise. Precisely for the same reason, this research study faced some limitations. To start with, at the literature review stage there was *glaring inadequacy of published literature on KM implementation in consulting companies*. The other limitation faced was *the apprehensions voiced by the respondents during primary data collection.* Practically all the respondents had to be convinced about the commitment to the confidentiality of their individual responses. The sensitivity of this issue made it necessary to leave the option of giving the organisational profile information at the individual respondent's discretion. Despite this, as against a planned sample of 100, responses could be obtained on the 'core data' from 108 respondents- *though some responses did not give the identification details of their firms.*

The confidentiality issue however, placed a limitation during comparative analysis of various data subsets out of the total data of 108 responses. For analysis of some data subsets, the number of clearly 'identifiable responses' turned out to be less then 30 and hence the treatment for 'small sample' size had to be given for these subsets, as compared to the data set as a whole or the bigger data subsets (like all firms from IT sector, all firms having a KM system or all Indian firms, etc.).

Another 'limitation' of this research relates to differing status of 'maturity level' of various organisations in knowledge management. The research was of course, bounded in scope to *consulting firms based in India.* At the field research stage however, a widely differing level of awareness, knowledge and maturity about knowledge management was encountered even within the bounded scope of research. Comparison of the two case

firms given in the thesis illustrates this point. Perhaps further research can also tackle the issue of widely different levels of KM maturity among Indian consulting firms.

Recommendations for Further Research

The current work forms the basis for monitoring and continuously improving the knowledge management performance of the consulting companies. Since the responses from IT consulting sector comprised a significantly large portion, all IT firms in India can directly benefit from this work. In addition, however the current study has the potential to initiate a stream of research for different specialised consulting sectors like management consulting, engineering project consulting, education consulting, health care consulting etc. Perhaps the awareness level and maturity about knowledge management will increase further among Indian consulting companies in the next 3-5 years. Hence further research on these different sectors will perhaps be more valuable after 3-5 years.

Another dimension for further research can be the KM maturity level itself. Some further research study can bring out a 'KMM Index' (Knowledge Management Maturity Index) for Indian consulting companies, as a companion of KMPI brought out by the current research study.

Finally, further research is also recommended for a comprehensive longitudinal case study of an organisation which has implemented KM from scratch to see if the KM performance measures suggested in this research can be correlated with its current business strategy.

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DECLARATION

I do hereby declare that the thesis entitled "**Emerging Knowledge Management Performance Measures for Consulting Firms**" submitted to the Faculty of Management Studies & Research, Aligarh Muslim University, Aligarh for the award of the degree of **Doctorate in Business Administration** is the record of original research work done by me during October 2001 to January 2004, under the supervision and guidance of **Dr. Salma Ahmed** (Internal Advisor, Department of Business Administration, Aligarh Muslim University) and **Dr. M. L. Singla** (External Advisor, Faculty of Management Studies, University of Delhi) and it has not previously formed the basis for the award of any Degree/ Diploma/ Associateship/ Fellowship or similar title to any candidate of any university.

New Delhi
January 7, 2004

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CERTIFICATE

This is to certify that the thesis titled "**Emerging Knowledge Management Performance Measures for Consulting Firms**" submitted to the Aligarh Muslim University in partial fulfillment of the requirements for the award of the degree of **Doctorate in Business Administration** is the record of original research work done by **Mr. Chander Shekher Arora** during the period of his study in the Department of Business Administration, Faculty of Management Studies & Research, Aligarh Muslim University, Aligarh, under my supervision and guidance and the thesis has not formed the basis for the award of any Degree/ Diploma/ Associateship/ Fellowship or similar title to any candidate of any university.

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C. S. Arora

Emerging Knowledge Management Performance Measures for Consulting Firms

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Chapter 1:

INTRODUCTION

Chapter 1: INTRODUCTION

"What can be measured is not always important and what is important cannot always be measured."
-- Albert Einstein

1.1 Background

There is a high level of interest in Knowledge Management (KM) amongst consulting firms as knowledge is their core asset and the consulting firms consider KM to be a core capability for achieving competitive advantage. Large consulting firms have been increasing their expenditure on information technology and communications infrastructure, developing Intranets and data warehouses, and using Internet to create their knowledge management systems. Global consulting companies like McKinsey, Accenture, Ernst & Young, KPMG, PriceWaterhouseCoopers, etc. as well as Indian companies like Infosys, Tata Consultancy Services, Wipro Technologies, etc. have all been investing heavily in their KM systems – even though they have adopted different approaches to manage knowledge. As examples, Ernst & Young spends about 6 percent of its revenue on KM and McKinsey spends about 10 percent. *However despite the pervasiveness of the view that KM is a core component of competitiveness for consulting companies, its performance evaluation for its effectiveness, is still difficult to determine.*

Relevance/ contribution of the present research

On the measurement and evaluation of KM's impact, Tiwana (2000) reports that despite his research on several companies that have been successful in implementing KM, he has "*yet to come across one that has a strong measurement program in place.*" Some companies like Buckman Laboratories, Canon, Skandia and Dow Chemical have begun to measure their Intellectual Capital (IC), with the belief that growth on this front is often a good indicator of future performance. Though measuring IC is a growing area of interest in KM field and metrics are being developed and applied by some of these firms, there has been a felt need for more research. A more representative framework of KM performance measures – specifically for knowledge-focussed organisations like consulting firms needed to be evolved.

Much of the existing literature on IC measurement stems from the traditional measures based on financial and accounting perspective. Traditional measurements like Return on Investment (ROI), Revenue growth, *Tobin's q* etc. typically look at organisational knowledge as a 'static' asset in an organisation. These provide a snapshot of the firm's state of intellectual health at a given point of time, but provide no direction for KM strategy development. No specific guidance can be derived out of the traditional financial measures to exploit the dynamic role of KM - if integrated with business strategy - because this involves assessment and monitoring of various other non-financial measures. The traditional financial/accounting measures of performance worked well for the industrial era, but now the system for measurement requires to be reformulated for the knowledge-based organisations. New 'intangibles' like customer satisfaction, employee satisfaction, availability of knowledge-sharing/ dissemination mechanisms, clarity of company's vision, CEO's leadership, competency mapping mechanisms, etc. assume particular importance for consulting firms whose survival and competitive advantage now depends on the how effectively these intangible assets are leveraged and evaluated.

The current research attempted to address the above limitations of traditional performance measures by examining the possible alternative measures of performance for consulting firms. Certain new metrics for measuring quantitative *as well as qualitative* indicators - including those from market/customer related, human/competency development, corporate leadership/strategy/KM practices and technology domains - have been proposed. ***The specific contribution of the research is by attempting to construct an integrated framework of KM based performance measures for consulting firms,*** which can be implemented straightaway – particularly by IT consulting firms.

1.2 Research Objectives and Scope

The present research was carried out to achieve the following objectives:

1. To examine the possible alternative measures of performance for consulting firms.
2. To propose certain new, innovative metrics for measuring quantitative *as well as qualitative* indicators including those from market/customer related,

human/competency development, corporate leadership/strategy/KM practices and technology domains.

3. To evolve an integrated *framework* of KM based performance evaluation measures for such consulting firms, and
4. To validate the concept and structure of the evolved framework through illustrative case studies.

The survey of previous research done as well as the study of secondary data on KM practices being adopted by various firms had revealed that there are, as yet, no perfect measures for knowledge work. Moreover, it is rarely possible to directly adopt a firm's performance metrics from one sector of economy (for example, assembly-line manufacturing or continuous processing) to another firm from a different sector (for example, consulting services). This is because differences exist between various sectors of business operations and even between firms following different approaches for managing knowledge, within a particular sector itself. In view of this inherent characteristic of the KM field, this ***research was bounded in scope only to consulting firms*** – being *knowledge-focussed* in operation. Also, the investigations involving questionnaire design, field interviews/experience-survey and case study interactions were confined to organisations ***based in India***, so that the above objectives of research could be successfully achieved - with concrete recommendations for application - within the time frame of this research.

1.3 Outline of Research Methodology

Since the KM field itself is of recent origin, not much of research literature was available on modelling for KM performance measures - particularly for consulting firms. As the starting stage of research process, *three streams of KM literature* – KM concepts, KM application in consulting organisations, and KM performance measurement – were reviewed. The literature on KM concepts clarified the prevalent concepts about the subject field. Inadequacy of published work in second stream of literature proved to be a challenge for the present dissertation work, though some idea about initial KM applications in some leading global consulting companies was of help. Similar

inadequacy of literature on KM performance evaluation comprising the third stream was also noticed. However, review of this stream of literature – comprising of some disparate and scattered research, but still appreciable for the focus and consistency - helped in showing the 'broad direction' for proceeding further. *The research framework - particularly the questionnaire/ interview schedule design and conceptual validation format through selective case studies - was broadly structured on the support of those earlier - though inadequate - research works.*

After extensive survey of available literature and secondary information, the first stage of research began as exploratory, and in the course of exploratory investigations and fieldwork, a conceptual "Framework" of KM performance measures was developed. In the second stage, the research moved to prescriptive phase. This required statistical tests of significance on all candidate measures to arrive at the 'top 12' KM measures for various data sub-sets forming the contents of the KM performance framework, followed by illustrative validation of the framework through some case studies. The insights gathered through the illustrative case study validation stage were incorporated into the finally recommended framework after detailed analysis and interpretation.

The structure/ presentation format of the recommended framework involves computation of an aggregate functional index KMPI (Knowledge Management Performance Index) and also pictorial presentations in 'radar charts' or 'bar charts' for KMI (Knowledge Management Intensity) and KMP (Knowledge Management Performance) values for any company.

1.4 Outline of the Thesis

After this chapter giving introductory background and scope of the research, Chapter 2 provides an 'encapsulated' treatise of the existing understanding (and *mis*understanding) about KM concepts, strategies, implementation roadmaps and managerial challenges in business enterprises. The aim and focus of this chapter is to provide an overview of KM as the broad management discipline and hence this chapter can be viewed as a

management guide for implementing KM systems in an organisation. Within this overview, this chapter also establishes the context for KM performance measurement, which is the topic of present research.

From the viewpoint of this research however, some concepts of KM had to be taken up in a little more detail for understanding and establishing relevance with KM assessment and performance evaluation. Also the KM-IT relationship is required to be surveyed in-depth for settling the 'confusion' between KM and IT functions. These *'supplementary' issues/ concepts of KM* are taken in the initial part of Chapter 3 on literature review. After that, Chapter 3 reviews two more distinct streams of literature – pertaining to *KM in consulting companies* and *KM performance measurement.* The implications of the literature reviewed for each of these three streams for the present study are also brought out. While attempting to bridge three separate streams of KM literature, this chapter thus provides a confluence of the different areas of KM research, paving the way for building the research framework for the present study.

Chapter 4 presents the research design and methodology - including the methods of data collection, analysis and presentation - used to address the research objectives and to validate the concept and structure of the "Framework of KM performance measures" evolved as an outcome of this research. The questionnaire/ interview schedule for primary data collection and the list of organisations forming the data sample are given at Appendix A and B respectively. Appendix C gives the 'Discussion Format' for facilitating the case study interactions.

Chapter 5 presents the observations on the outcome of primary data analysis and discussions on the implications for adoption of the proposed framework for KM performance measurement. The chapter then describes a comparison of 4 firms as 'case studies' for illustrative validation of the concept, structure and contents of the proposed framework. Detailed background information about two case firms studied in-depth is given in Appendix D.

Finally, Chapter 6 gives concluding comments on the research study by analysing the investigations with reference to the research aims and objectives stated earlier in this chapter. The specific recommendations for management are given to implement the proposed framework of KM performance measures. Limitations of the present research and recommendations for further research studies are also given.

Chapter 2:

KNOWLEDGE MANAGEMENT – AN OVERVIEW

Chapter 2: KNOWLEDGE MANAGEMENT – AN OVERVIEW

"We must learn how to manage knowledge collectively"
--A.P.J. Abdul Kalam

2.1 Introduction

In the past few years, "Knowledge Management" (KM) has become the latest fad in management circles. It's difficult picking up either a business or technology journal without coming across some mention of KM. This new buzzword is being hailed as the next big thing in corporate scene. However because of the hype and the sales pitch created by the technology vendors around KM, the average corporate executive finds himself lost in this noise and clutter about KM. Given all this attention to this rather "hottest" topic, it is surprising to note that many people still cannot even put a definition to KM. This chapter helps in demystifying KM by putting it on a stronger conceptual foundation, clarifying about what KM *is* and what KM *is not*, and eventually understanding how it can be used to drive improved business performance.

2.2 Data, Information and Knowledge

Before understanding KM, it is important to first understand the distinction between data, information, knowledge (and wisdom). Though one encounters these words in everyday vocabulary, in the field of business management, they have a different connotation.

> "Like water, this rising tide of data can be viewed as an abundant, vital and necessary resource. With enough preparation, we should be able to tap into that reservoir – and ride the wave – by utilizing new ways to channel raw data into meaningful information. That information, in turn, can then become the knowledge that leads to wisdom." (Les Alberthal [1])

Data comes first. Basically, it is just a meaningless point in space and time, without any reference to either space or time. It is like an event out of context, a letter out of context, a word out of context. The key concept of data is being "out of context". And since it is out of context, it is without a meaningful relation to anything else. For example, "seven" as a piece of data may mean different things to different people. However, if someone

[1] Remarks to the Financial Executives Institute, October 23, 1995, Dallas, TX

says, "This new model of car air conditioner can lower the temperature in the car by seven degrees centigrade", a message has been composed using data items like "seven", "degrees centigrade" and "temperature" to inform a person about the cooling effectiveness of the car air conditioner. This is what is called *information* – data arranged in a meaningful pattern to provide a context.

Information is just not a collection of data. A collection of data for which there is no relation between the pieces of data is not information. The pieces of data may represent information, yet whether or not it is information depends on the understanding of the person perceiving the data. In the above example, based on the statement "This new model of car air conditioner can lower the temperature in the car by seven degrees centigrade" a person intending to buy the car air conditioner can form his opinion or understanding about the collection of data items provided to him. Hence this statement provides some meaningful *information* to him. Information is quite simply an understanding of the relationships between pieces of data, or between pieces of data and other information.

What does the prospective buyer of car air conditioner do with the above information? He tries to make a judgement based on this information. His prior experience, logic and understanding of the weather and relative cooling effectiveness of various car air conditioners comes into play. Is seven degree centigrade cooling good enough for him or not depends upon his perceived requirements and previous experience. So he is able to make a judgement based on the information provided to him and his experience and understanding.

This capability and experience of using information to make judgements and the ability to link them to decisions or actions is called *knowledge*. For example the buyer of car air conditioner will go for the new model only if his previous experience makes him rate it more effective than earlier models. If the similarly priced earlier models gave just 4-5 degrees cooling, then the new model is worth serious consideration. However, if the peak summer temperature outside in the city of the prospective buyer is 45 degrees Celsius,

then even the new model is not effective for that city say Aligarh or Delhi. On the contrary, perhaps the buyer will perhaps go for it if he lives in Shimla. So the ultimate decision taken can be different by different persons, even though the information provided is the same. This amplifies the difference between information and knowledge.

As can be inferred from above, knowledge is highly contextual and depends largely on the mental models, experiences, values and beliefs of individuals and organisations. As illustrated above, if two persons have significantly different experiences, values and beliefs, they are likely to take decisions and act in a manner that is very different, even though they may both act on the same information.

While information entails an understanding of the relations between data, it generally does not provide a foundation for why the data is what it is, nor an indication as to how the data is likely to change with time or can have different meaning for different persons. Information is a relationship between data and, quite simply, is what it is, with great dependence on context for its meaning and with little implication for the future.

Beyond relation, there is pattern, where pattern is more than simply a relation of relations. Pattern embodies both a consistency and completeness of relations, which to an extent, creates its own context. Pattern also has both an implied repeatability and predictability.

When a pattern relation exists amidst the data and information, the pattern has the potential to represent knowledge. It only becomes knowledge, however, when one is able to realise and understand the patterns and their implications. The patterns representing knowledge have a tendency to be more self-contextualising. That is, the pattern tends to a great extent, to create its own context rather than being context dependent to the same extent that the information is. A pattern that represents knowledge also provides, when the pattern is understood, a high level of reliability or predictability as to how the pattern will evolve over time, for patterns are seldom static. Patterns which represent knowledge have a completeness to them that information simply does not contain.

Wisdom arises when one understands the foundational principles responsible for the patterns representing knowledge being what they are. And wisdom, even more so than knowledge, tends to create its own context based on these universal, context independent foundational principles.

Figure 2.1 below[2] places data, information, knowledge and wisdom 'in a context'

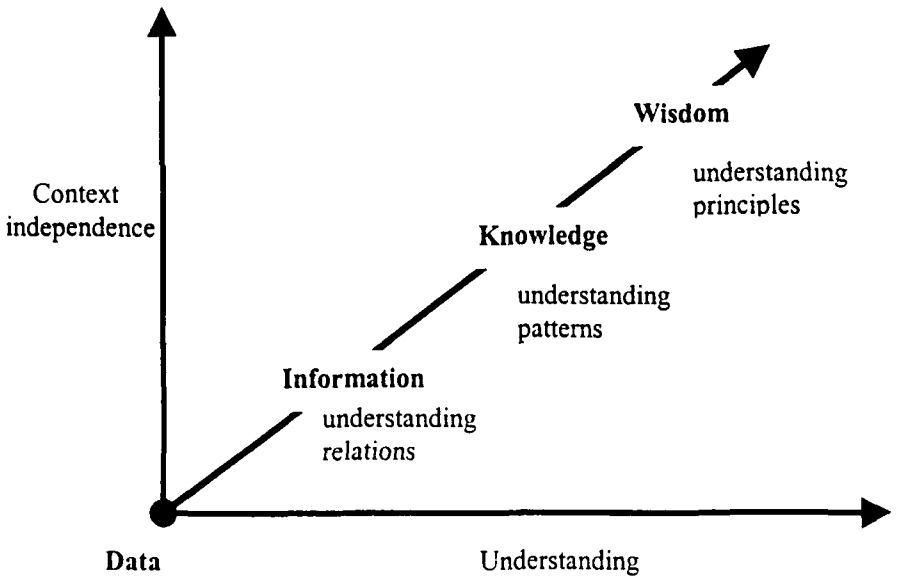


Figure 2.1: Data, Information and Knowledge in Context

In summary, the following associations can be made from *data*, which is just raw, smallest, meaningless collection of figures:

- *Information* relates to description, definition or perspective (what, who, when, where)
- *Knowledge* comprises strategy, practice, method or approach (how)
- *Wisdom* embodies principle, insight, archetype or paradigm (why)

We'll now dwell deeper on knowledge and knowledge management which form the bedrock for this dissertation.

[2] Source: Bellinger, Gene, *Knowledge Management – Emerging Perspectives*, http://www.outsights.com

2.3 What is Knowledge?

If we are concerned about knowledge management, we need to be clear about what we mean by the word *knowledge*. Taking off from the difference between, data, information and knowledge illustrated above, a working definition of knowledge as suggested by Thomas Davenport and Laurence Prusak, is given below:

> "Knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms " (Davenport & Prusak[3])

To put it more simply: Knowledge is simply *actionable information*. Actionable refers to the notion of *relevant, and nothing but the relevant* information being available in the right place at the right time, in the right context, and in the right way so anyone can bring it to bear on decision making all the time. Knowledge is the key resource in intelligent decision-making, forecasting, design, planning, diagnosis, analysis, evaluation, and intuitive judgement making. It is formed in and shared between individual and collective minds. It does *not* grow out of databases but evolves with experience, successes, failures, and learning over time.

From a management perspective, there are clear distinctions between two types of knowledge. Common practice now refers to them as *explicit* and *tacit* knowledge. They can be described as follows:

- Explicit knowledge is precisely and clearly expressed, with nothing left to implication. Generally in the business situations, it is fully stated and openly expressed without reservation.

[3] *Working Knowledge How Organizations Manage What They Know,* Harvard Business School Press, Boston (1998), 5

- Tacit knowledge is understood but not clearly expressed. It is often personal knowledge embedded in individual experience and involves intangible factors, such as personal belief, perspective and values.

We need to develop the characteristics of these categories of knowledge to understand how they can be managed.

Explicit knowledge

Companies hold substantial documented knowledge in patents, technical specifications and procedures. Additionally, information is routinely collected, stored and distributed as management information. Financial, marketing, production, and customer service/ support information is usually codified and is ready for different distribution channels. This information makes up the majority of explicit knowledge.

All of this information has value in its own right and in most organisations could be used more effectively. There is also a need to seek even more explicit knowledge in the daily conduct of business. Explicit knowledge is normally available readily in all communications with customers, suppliers, distributors, competitors, government agencies and the community at large.

Tacit knowledge

By definition, tacit knowledge is more difficult to recognise and collect; let alone codify, store and distribute. Yet this is the key component of knowledge management. Releasing the true potential of this asset on a continuous basis poses the sheer challenge for consulting companies and forms an important component for an effective performance measure for knowledge management.

The most valuable asset of every organisation – particularly a consulting firm – is the hidden or tacit knowledge buried in the minds of employees and other people in regular contact with the organisation. This includes experience, learning from doing as well as study, observation and informal information or even gossip.

2.4 Components of Knowledge

Apart from the explicit knowledge available in various company documents and codified in computers, KM strategy and a KM system in any company must support the following key components of knowledge:

Judgement

Very unlike data and information based on data association, knowledge has a component of judgement attached to it. A colourful and precise stock ticker and a real time graph on the web site can be excellent information for a share broker, however in real value it means nothing if he can't act upon it or make a decision based on the data they provide. Unactionable information is *not* knowledge. However if the share broker recognises that he needs to sell the shares when the trend chart looks like a particular pattern or need to hold when it looks like another pattern, he is making judgement based on it. Judgement allows knowledge to rise above and beyond an opinion when it reexamines itself and refines every time it is applied and acted upon.

Experience

Knowledge is largely derived from experience. Being able to transfer knowledge implies that a part of experiential knowledge also gets transferred to the recipient. The benefit of experience lies in the fact that it provides a historical perspective that helps better understand present situations. Experienced people are usually valued in a company and are often paid more, because they possess this historical perspective from which they can view current situations – something that a typical newcomer will almost never have. This perspective allows them to make connections with what is happening now with what might have happened earlier, and evaluate decisions in that light.

As people's experience in their jobs increases, they begin to figure out *shortcut solutions* to problems they have seen before. When they see a new situation, they match it to compare patterns that they are aware of. An experienced car driver, for example, recognises that excessive rattle in the car could mean a flat tyre. Similarly a computer

hardware technician can diagnose the fault for a computer that fails to boot up, with help from his earlier experience of having diagnosed a failed power supply or a bad hard drive for computers with similar fault symptoms. With experience, these *scripts* guide our thinking and help avoid useless decision paths that we might have followed earlier. Such *rules of thumb* or *heuristics* provide a single option out of a limited set of specific, often approximate approaches to solving a problem or analysing a situation accurately, quickly and efficiently.

Not only in the simplistic situations like above, even in the complex business environment, it is the subconscious repertoire of scripts and rules of thumb that make experienced managers more valuable than experienced new hires. Many such rules of thumb are in people's heads as tacit knowledge, providing the power that decades of machine learning research have been unable to give to business.

Values, Assumptions and Beliefs

Business processes are very often, based on a set of assumptions. These are so natural and so deeply ingrained within the minds of people who hold them that they find their way into most of the decisions that people make, but they are never expressed. For example engineers, by their training, *assume* that anything that is behaving strangely has to have an underlying rationale. Managers often assume that their ordinate goal is to maximise their profit centre's financial profits. One level above this, people might assume that companies are rational and neutral. And for a good reason, after the widespread influence of Herbert Simon's research on the concept of *bounded rationality.*

Companies are often shaped by the beliefs of a few key people working there. In some companies - particularly the visual media and dotcom companies – the culture of having fun is ingrained in their work environments; while creating innovative and aesthetically great products (like iMac or iBook) is done as a matter of conviction and belief in other companies like Apple. The belief on profits and market dominance by Microsoft's founder Bill Gates has been brought into the very character of the firm.

Such values, beliefs and assumptions are integral and key components of knowledge. These values and beliefs explain the varying reactions of different companies to the same development and often differentiate a risk-taking competitor from a risk-averse one. And knowing, capturing and sharing this component of knowledge can make all the difference between complete knowledge and incomplete, unactionable information. It is mentioned here that not all beliefs can be captured or codified explicitly and this is still a separate area of ongoing research in the field of KM.

Intelligence

When knowledge can be applied, acted upon when and where needed, and brought to bear on present decisions, and when these lead to better performance and results, that knowledge often qualifies as intelligence. When it flows freely throughout the company, is exchanged and developed further, it transforms the company to an *intelligent enterprise.*

Apart from the above key components, knowledge comes into the KM system of a company from various other sources. A roundup of the sources, which feed a KM system of a company, is given in Table 2.1 below:

Table 2.1: Sources of Knowledge that feed a KM System[4]

Source	**Explicit/ Codifiable**	**Tacit/ Needs Explication**
Employee knowledge, skills, and competencies	Yes	Yes
Experiential knowledge (individual/group level)	Yes	Yes
Team based collaborative skills		Yes
Informal shared knowledge	Yes	Yes
Values		Yes

[4] Source: Tiwana, Amrit *The Knowledge Management Toolkit*, Prentice-Hall (2000), 71

Norms		Yes
Beliefs	Yes	Yes
Task-based knowledge	Yes	Yes
Knowledge embedded in physical systems	Yes	Yes
Human capital		Yes
Knowledge embedded in internal structures		Yes
Knowledge embedded in external structures	Yes	Yes
Customer capital	Yes	Yes
Experience of employees	Yes	Yes
Customer relationships	Yes	Yes

Although the list given above is not exhaustive, it is clear that much of the knowledge can be explicated, put into KM systems and reused. However, some critical pieces of tacit knowledge are extremely difficult, if not impossible, to externalise in such a manner.

2.5 What is Knowledge Management?

After knowledge, let's now deal with the other lofty concept – Knowledge Management (KM). This concept has been debated by academics and managers since long, and so is not new. Business organisations have been practising it in some way or the other - however informal and unstructured - but only a few businesses have mastered it. Despite this, as a field of systematic study and discipline, KM is definitely new. Many practitioners have come up with myriad definitions and often there is little agreement on any one. So in this and the following section, let's try to arrive at an acceptable definition and clarify the term further.

In the simplest terms, knowledge management means exactly that: "management of knowledge". In our context, it can be extended to "management of organisational

knowledge for creating business value and generating a competitive advantage." KM enables the creation, communication and application of knowledge of all kinds to achieve business goals and often refers to broad collection of organisational practices and approaches related to generating, capturing and disseminating knowledge relevant to the organisation's business.

One particular definition given below (proposed by Gartner Group[5]) is quite comprehensive. This definition not only tells us what KM is all about, but also emphasise on what is required for effective KM, and more specifically what it can do or not do.

> "KM is an emerging set of *processes, organisational structures, applications*, and *technologies* that aim to leverage the ability of capable, responsible, autonomous individuals to act quickly and effectively KM achieves this end by providing this *capable, responsible, autonomous individual* with ready access to the company's entire store of knowledge, including much of what is not documented. KM requires an integrated approach to identifying, managing, and – most importantly – sharing the company's information assets, including database, documents, policies and procedures (explicit knowledge) as well as undocumented expertise resident in individual workers (tacit knowledge) "

To get a better insight into this definition, let's look at some keywords. It speaks of *processes, organisational structures, applications* and *technologies.* Knowledge is too critical an asset – particularly for a consulting firm – to be left to its own devices. To leverage knowledge it can no more be left as an informal activity and so KM has to be seen as an important business process. And as with any other business process, be it financial management, human resource management or supply chain management, this process too would require appropriate organisational structures and a framework for measuring its effectiveness to be put in place.

Another set of keywords is *capable, responsible, autonomous individual* As explained earlier while defining knowledge, it is highly contextual and person dependent. Having the right people with appropriate competencies and skill-sets is equally important for the

[5] Source "Building Resource Champs", *The Economic Times*, September 11, 2000

KM processes to be effective. Extending the argument further for bringing relevance to the subject of this dissertation, any effective framework for measuring the KM performance in a company has to specifically factor in the people dimension too.

2.6 What Knowledge Management is ***not***?

KM as a topic has generated so much buzz in business circles that a host of technology consultants and IT vendors have rushed in to make the "quick bucks". Claimed to be dealing in KM, some vendors of desktop PCs, search engines, enterprise software, storage devices, scanners and even photocopiers are offering the "KM Solutions" for the organisations. Within this "vendor noise" however, is a concrete reality that KM is much more than mere technology. It is a potent competitive tool for delivering competitive advantage and so KM must be grounded solidly in the context of business strategy. Competing on knowledge requires either aligning business strategy to what the company knows or developing KM capabilities required to support a business strategy. Amidst the IT vendor sales pitches claiming to offer KM solutions, let's be clear on what KM is *not*.

- *KM is not knowledge engineering*. Knowledge engineering is a vital part of artificial intelligence (AI) within the discipline of computer science, but is not related to KM which is a business problem falling within the domain of information systems and management. KM melds information systems *and people* in ways that knowledge engineering has never been able to.

- *KM is about business processes, not just technology*. Management of knowledge has to encompass and improve business processes. IT can be the biggest enabler for effective KM, if used correctly. However, focussing on the *T* and not the *I* in *IT* will deliver little value. The T will never be used effectively, if the people who are supposed to use it do not understand its alignment with the business strategy.

- *KM is not about building an Intranet*. A KM system can use a firm's Intranet as its front end and a building block, but must never be confused for one. There are crucial differences between an Intranet and KM system in terms of content, performance,

- *KM is not about "capture"*. Document management vendors often claim so but KM is really not about capturing data or documents' "knowledge". While, a document management system lacks context, experience and insight, it still has a marginal place in KM technology. This is because knowledge, in its entirety, cannot be captured.

- *KM is not about a one-time investment.* KM, like other future-oriented programmes, requires consistent attention (and investment) over a substantial period of time even after it begins to deliver results. KM critically requires performance measures or metrics that allow the firms to measure its impact, provide room for improvement, and to provide a robust basis of resource allocation

2.7 Knowledge Management as a Set of Processes

The comprehensive definition of KM from the Gartner Group given in section 2.5 above is based on a framework for consideration of KM as the "set of processes" by which knowledge is manipulated in an organisation. The set of processes[6] comprising the KM programme in an organisation is as follows:

1. *Knowledge creation:* To discover, realise, conclude, articulate and discuss for creating new knowledge
2. *Knowledge capture:* Includes documenting, digitising, extraction, representation and storage of relevant knowledge
3. *Organising knowledge:* Structuring, cataloging, abstracting, analysing and categorising of knowledge for specific usage
4. *Knowledge access:* Presentation, display, notification, profiling and searching the knowledge for a specific application
5. *Knowledge application or use:* Includes application of knowledge for business performance, providing service, making new products and continual learning at organisational level.

[6] Source: *KM Architecture and Technology*, Presentation at Gartner Group Symposium, Florida (1999)

The set of KM processes primarily involves people. Thus, KM activities are fundamentally linked with collaboration, interaction with people, and the systems, which support this. The technology plays an enabling role for KM processes. For example, use of company Intranet facilitates collaboration and interaction among people, but it is finally the human dimension, which plays a driving role for KM processes.

2.8 Knowledge Management Strategies

Any organisation depending on people competencies and the development of ideas should have a KM strategy. This is particularly true for consulting firms. The way these firms leverage the people skills and ideas may determine the strategic direction and mode of implementation of KM. Some firms may choose to automate KM while others will emphasise a people centered knowledge sharing approach. Both are valid approaches and the choice should be determined by the nature of the firm and its business strategy. Choosing the wrong approach or trying to implement both processes at the same time can be dangerous.

A research carried out at Harvard Business School[7] into how different consulting companies approached the subject revealed the following:

- The *codification strategy* is centered on computer systems. Knowledge is documented, codified and stored in databases (warehouses) where it can be accessed and used easily by anyone in the organisation
- The *personalisation strategy* is centered on people with in-depth knowledge, which they have developed from experience and study, and is mainly shared through direct person-to-person contact. Here the computer is used to help people communicate knowledge rather than store it.

The Harvard study notes that though examples are based on consulting companies, they are not unique to consulting. These two distinct strategies are at work in many other

[7] Hansen, Morten T, et. al. "What is your strategy for managing knowledge", *Harvard Business Review*, (March –April 1999) 106-116

sectors. Indeed the choice between codification and personalisation is the central issue facing all organisations involved in KM. This decision depends on the nature of the organisation and its business objectives.

The Table 2.2 below compares the two KM strategies followed by consulting firms.

Table 2.2: How Consulting Firms Manage Their Knowledge?

Codification Strategy Reusing codified knowledge through high-quality, reliable and fast information systems implementation	**Personalisation Strategy** Channeling individual expertise for providing creative, analytically rigourous advice on high-level strategic problems
Reuse Economics ▪ Invest once in knowledge asset; reuse it several times ▪ Use large teams with a high ratio of associates to partners ▪ Focus on generating large overall revenues	**Expert Economics** ▪ Charge high fees for highly customised solutions to unique problems ▪ Use small teams with a low ratio of associates to partners ▪ Focus on maintaining high profit margins
People-to-documents ▪ Develop an electronic document system that codifies, stores, disseminates and allows reuse of knowledge ▪ Invest heavily in IT to connect people with reusable codified knowledge ▪ Hire new college graduates for knowledge reuse and implementation ▪ Train people in groups through computer-based learning ▪ Reward people for using and contributing to document databases	**Person-to-person** ▪ Develop networks for linking people for sharing tacit knowledge ▪ Invest moderately in IT; the goal is to facilitate conversions and the exchange of tacit knowledge ▪ Hire MBAs who like problem solving and can tolerate ambiguity ▪ Train people through one-to-one mentoring ▪ Reward people for directly sharing knowledge with others

Examples	Examples
Ernst & Young, Anderson Consulting	McKinsey & Company, Bain & Company

Above table provides some guidance on the selection of alternative KM strategies. The codification route lends itself to organisations that rely heavily on explicit knowledge. The personalisation strategy is more directed at companies that rely heavily on tacit knowledge. Some other characteristics favouring each strategy[8] are given in Table 2.3:

Table 2.3: Characteristics favouring different KM strategies

Favouring codification	Favouring personalisation
Similar products or services for each customer	One off products, services or projects for each customer
Work may demand high skills but relatively little creativity	High premium on creativity and innovation
Business and market strategies based on analysis of specific knowledge	Business and market strategies based on 'feel' or intuition
Ratio of operational staff to leaders very high	Ratio of operational staff to leaders almost non-existent
Relative similarity in operating characteristics over locations and functions	High diversity in operating characteristics over locations, functions and markets

Within the general guidelines given above, the decision on KM strategy to be adopted by a firm must consider the specific sector of the business of the firm and the specific assessment and evaluation of various KM dimensions and infrastructure.

2.9 Building a Knowledge Management System

[8] Source: Macdonald, John "*Understanding Knowledge Management in a week*",Hodder & Stoughten, London (1999)

KM is a complex activity and needs a concrete plan for designing, developing and deploying the KM system linked with business strategy, for delivering business results. A 10-step KM roadmap[9] to guide through the entire process of creating a business-driven KM strategy; designing, developing and implementing a KM system; and effecting the soft changes required to make KM work is given below. The ten steps of KM roadmap are categorised in four distinct phases.

Phase 1: Infrastructural Evaluation

Step 1: Analysing existing infrastructure

Step 2: Aligning knowledge management and business strategy

Phase 2: KM System Analysis, Design, and Development

Step 3: Designing the KM architecture and integrating existing architecture

Step 4: Auditing and analysing existing knowledge assets and systems

Step 5: Designing the KM team

Step 6: Creating the KM blueprint

Step 7: Developing the KM system

Phase 3: Deployment

Step 8: Deploying, using the result-driven incremental methodology

Step 9: Change management, culture, reward structure design, and the choice of Chief Knowledge Officer

Phase 4: Performance Evaluation

Step 10: Measuring results of KM, devising ROI metrics, evaluating system Performance, and incrementally refining the KM system

[9] Source: Tiwana, Amrit, *ibid.*, 101

Each of the four phases is explained further:

The first phase of the 10-step roadmap involves two steps. In the first step, the firm analyses its existing infrastructure and then identifies concrete steps it can take to leverage and build its KM system. In the second step, knowledge gaps are analysed by creating knowledge maps for the firm. These knowledge maps are further used to create a high level strategic link between business strategy and KM. This link can further develop both the KM strategy and system in a manner that aligns them with business performance and objectives.

When such an alignment between KM and business strategy is clearly established at the outset, one can be sure that the firm's KM system is moving in a direction that holds promise for long-lasting competitive advantage and that it will actually benefit both the firm's employees and its bottom line.

The second phase of KM implementation involves analysis, design, and development of the KM system. For deploying KM, one must select the infrastructural components that constitute the KM system architecture. KM systems use a seven-layer architecture and the technology required to build each layer is readily available. Integrating these technology components to create the KM system model requires thinking in terms of an 'infostructure' rather than an infrastructure. The seven layers of KM architecture and the associated technology components making up each layer are as follows:

1. User-interface layer
    - Browser, GUI tools
2. Access & Authentication layer
    - Authentication, Recognition, Firewall, Security, Tunneling
3. Collaborative Intelligence and Filtering
    - Intelligent agent tools, Content personalisation, Search, Indexing, Meta tagging
4. Application layer

- Skill directories, Yellow pages, Collaborative work tools, Video Conferences, Digital white boards, Electronic forums, Rationale capture tools, DSS tools, GDSS Tools

5. Transport layer
    - Web and TCP/IP deployment, Streaming audio, Document exchange, Video Transport, VPN core, Electronic mail, POP/ SMTP support
6. Middleware and Legacy Integration layer
    - Wrapper tools (such as TCL/TK or scripts to integrate legacy or cross-platform data)
7. Repositories
    - Legacy data, Data warehouse, Discussion Forums, Document Bases, etc.

For integrating various technologies for the seven-layer architecture, the first big choice of course is the collaborative platform. The firm can choose to use an open standard such as Web, or opt for a packaged solution such as Lotus Notes or a similar proprietary group support platform. The firm has also to create the profiling mechanisms for push- and pull-based knowledge delivery while balancing cost versus value-added for each additional enabling technology component. While choosing these components, the corporate culture and work norm existing in the company has to be considered.

The next step after KM architecture and design is to audit and analyse the knowledge assets within the firm to identify those that are both critical and the weakest. This enables arriving at a strategic position for the firm's KM system, in line with the strategic gaps identified earlier. Depending on this strategic position, next the design of KM team is done. To design an effective KM team, the firm must identify key stakeholders both within and outside the firm and also identify the sources of expertise needed to successfully design, build, and deploy the system while balancing the technical and managerial requirements.

The KM team so identified builds upon a KM blueprint that provides a plan for building and incrementally improving a KM system. The seven layers of KM architecture have to

be specifically understood in the context of the company for determining how each of these can be optimised for performance and scalability as well as high levels of interoperability. Integration of work from all preceding steps so far culminates in a strategically oriented KM system design at this stage. The final step of this phase is that of actually putting together a working system integrating an array of hardware (including copiers, printers, and scanners) and software into the KM system.

The third phase in the 10-step roadmap involves the process of deploying the KM system built in the preceding phase. This phase involves:

- Deployment of the system with a results-driven incremental technique. This involves the selection and implementation of a pilot project to precede the introduction of a full-fledged KM system

- Cultural change, revised reward structures, and the choice of using (or not using) a Chief Knowledge officer (CKO) to make KM produce results. This is perhaps the most important complimentary step that is critical to the acceptance, and the consequent success, of a KM system in any company.

The last phase of the KM roadmap involves one step that most companies have been struggling with (*and forms the subject matter of the present dissertation*): measuring business value of KM. When pushed for hard data on KM performance measures, most firms have often resorted to ill-suited and easily misused approaches, such as cost-benefit analysis, net present value (NPV) evaluation, vague ROI measures, or at best, Tobin's *q*. Very often, most companies are vulnerable to the following pitfalls in their choice of KM performance metrics:

- Using too many metrics
- Delayed and risky rewards tied to metrics
- Choosing metrics hard to control
- Choosing metrics hard to focus on

- Choosing metrics that neglect the "soft results" or intangible outcomes
- Choosing metrics that are too rear-view oriented
- Measuring the wrong things

A robust set of company-specific metrics avoiding above possible pitfalls is necessary to be devised to measure the KM performance. Apart from proving the impact of effective KM, well designed KM metrics enable the refinement of KM design through subsequent iterations. The present research addresses this issue in detail in the context of consulting firms.

2.10 Challenges of Knowledge Management[10]

The challenges for management in developing and implementing a successful knowledge management system are numerous. A few challenges of considerable interest to the CEO/ top management team are as follows:

Getting employees on board

The major problems that occur in KM usually result because companies ignore the people and cultural issues. It is critical to establish a culture that recognizes tacit knowledge and encourages employees to share their knowledge. The need to sell the KM concept to employees shouldn't be underestimated; after all, in many cases employees are being asked to surrender their knowledge and experience — the very traits that make them valuable as individuals.

Typically, the business organisations encounter the following impediments to knowledge sharing and reuse, which are to be handled tactfully by the leadership:

- *"Knowledge is Power".* This common saying reflects one of the main underlying challenges to the success of any knowledge management initiative. Knowledge

[10] Source: Arora C.S., From Information Technology to Knowledge Management: The Challenges Ahead for Corporate Managers, *Chartered Secretary,* July 2003, pp. 970-973

hoarding is often cited by managers as one of the key impediments to knowledge flows. Why would one individual share secrets with the rest of the organisation if he or she feels that this knowledge ensures his or her continued future 'value'? And if this individual then leaves the company, then the valuable knowledge leaves too. Thus, this issue is becoming increasingly important as the rate of employee turnover continues to rise in knowledge-based sector.

- *"Not-Invented-Here (NIH)" syndrome.* The opposite to the "Knowledge is Power" impediment is the NIH syndrome – a desire to develop one's own solution rather than reuse existing solutions. Often one comes across individuals who actually avoid using the company's internal databases and solutions, in part because there was a certain 'prestige' associated with being hooked into external networks of like-minded people – like professional associations, vendor - sponsored user communities, business school alumni associations, internet chat forums ,etc.

- *Opportunity cost of time.* In terms of knowledge sharing, taking the time to teach a routine to fellow colleagues or to contribute to a company database means losing valuable time that could be spent on more self-rewarding activities. And in terms of knowledge acquisition, the reasons for the use of the Internet over internal sources may also be a function of opportunity cost. Individuals often feel that it takes too long to search for a solution somewhere in the firm's knowledge repositories and then adapt it to their needs. They feel that it is relatively quicker to search for an external solution with the help of external associations including Internet searches.

- *Lack of trust.* With the introduction of advanced multimedia communication infrastructure, employees can communicate with each other anywhere within a company – spread over different locations. However, effective communication using these systems appears to be dependent upon the establishment and maintenance of trust between the concerned employees, which is dependent on face-to-face communication. Thus, individuals may not trust solutions that have

been developed by others within the firm if they have not developed a face–to-face relationship. And in certain cases, individuals feel that they can trust others they know outside the firm over individuals they do not know inside the same firm.

- *Difficulty in making knowledge explicit.* On an equally challenging level is the sharing of tacit knowledge or that knowledge which has not yet been made explicit. An example of this is the manner in which an experienced project manager determines the future potential of projects. This knowledge is extremely difficult to articulate and not only that, much of the valuable knowledge is lost in this articulation process. In addition, this leads to problems when knowledge from one setting within the firm is to be transferred to another setting.

One way companies can motivate employees to participate in KM is by creating an incentive programme. However, then there's the danger that employees will participate solely to earn incentives, without regard to the quality or relevance of the information they contribute. The best KM efforts are as transparent to employees' workflow as possible. Ideally, participation in KM should be its own reward. If KM doesn't make life easier for employees, it will fail.

Allowing technology to dictate KM

It has already been explained in detail earlier that KM is not a technology-based concept. Managers often fall prey to the IT hardware and software vendors touting their 'all-inclusive KM solutions'. Companies that implement a centralised database system, electronic message board, Web portal or any other collaborative tool in the hope that they've established a KM program are wasting both their time and money.

While technology can support KM, it's not the starting point of a KM programme. The KM decisions should be based on who (people), what (knowledge) and why (business objectives). The how (technology) decisions should be saved for last.

Not having a specific business goal

A KM program should not be divorced from a business goal. While sharing best practices is a commendable idea, there must be an underlying business reason to do so. Without a solid business case, KM is a futile exercise.

KM is not static

As with many physical assets, the value of knowledge can erode over time. Since knowledge can get stale fast, the content in a KM programme should be constantly updated, amended and deleted. What's more, the relevance of knowledge at any given time changes, as do the skills of employees. Therefore, there is no endpoint to a KM program. Like product development, marketing and R&D, KM is a constantly evolving business practice.

Not all information is Knowledge

The difference between data, information and knowledge has been illustrated earlier in detail. Distinguishing relevant knowledge from the sea of data and information, nevertheless remains a serious management challenge. Companies diligently need to be on the lookout for an effective mechanism to separate knowledge from the information overload. Quantity rarely equals quality, and KM is no exception. Indeed, the focus of an effective KM programme is to identify and disseminate knowledge gems from a sea of information.

Not having a framework for KM Evaluation/ Performance Measurement

Finally, the last – but not the least - managerial challenge is the measurement and evaluation of the business impact of KM programme in a company. The traditional measurements (such as ROI and Tobin's *q*) of business or financial performance are not effective for measurement of KM programme because these traditional measures provide a snapshot of company's health at a given point of time, but provide no direction for KM strategy development. Some companies like Skandia, Buckman Laboratories, Dow Chemical, Canon, etc have begun to measure their intellectual capital (IC), with the belief that growth on this front is often a good indicator of future financial health. But here too, the dynamics of KM process in an organisation is not fully mirrored in IC as a KM performance measure. The role of factors likes customer satisfaction, employee satisfaction, vision and leadership of the top management, values and beliefs, relationships, etc. – which are dynamic in nature – for construction of a performance framework for KM becomes very important for knowledge-driven sector like consulting companies.

The present dissertation is focussed specifically on this managerial challenge for putting in a place a representative and effective framework of performance measures. Consulting companies are focussed as the target in the present research, because for consulting companies, KM forms the core capability to achieve competitive advantage.

2.11 KM Research Related to Present Study

This chapter provided an 'encapsulated' treatise of the existing understanding (and *mis*understanding) about KM concepts, strategies, implementation roadmaps and managerial challenges. The aim and focus of this chapter was to provide an overview of KM as the broad management discipline and hence can be viewed as a management guide for implementing KM systems in an organisation. Within

this overview, the context has been established for KM Performance Measurement, which is the subject of present research.

From a researcher's viewpoint however, some concepts of KM have to be taken up in a little more detail for understanding and establishing relevance with KM assessment and performance evaluation. Also the KM-IT nexus – though already explained in this chapter at an overview level – requires to be surveyed in-depth for settling the 'confusion' decidedly before proceeding further. These 'supplementary' issues/ concepts of KM are taken in the initial part of next chapter on literature review.

After taking up these supplementary KM concepts in the initial part, the next chapter then provides a review of the present literature on KM applications in consulting firms and the present state of research on KM performance measurement. The implications of the literature reviewed for the present research are also given alongside.

Chapter 3:

REVIEW OF CONTEMPORARY LITERATURE

Chapter 3: REVIEW OF CONTEMPORARY LITERATURE

"If you have an idea, and I have an idea, and we exchange these ideas, then each of us will have two ideas"

--George Bernard Shaw

3.1 Introduction

By providing an overview of KM concepts, processes, strategies, implementation guide and key managerial challenges, the last chapter had set the foundation for the extensive literature survey undertaken for the present research. That in itself, was based on review of recent literature on KM. In particular the published works of Tiwana (2000), MacDonald (1999), Hansen et al. (1999) and Davenport & Prusak (1998) acted as the 'anchors' for settling on the fundamental concepts of KM and clearing the lingering doubts on the subject.

Taking off from that stage, the present chapter first surveys in-depth additional literature relating to some supplementary concepts of KM relevant to the topic of present research. It is then followed by review of two distinct streams of literature – pertaining to KM in consulting companies and KM performance measurement. The implications of the literature reviewed for each of these three streams for the present study are also brought out. While attempting to bridge three separate streams of KM literature, this chapter thus provides a confluence of the different areas of KM research, paving the way for building the research framework for the present study.

3.2 Knowledge Management – Supplementary Concepts

The concept of KM as a set of processes as given by the Gartner Group was explained in last chapter. This process concept has been extended now to 'map' the KM space over *type, level* and *context*. The KM-IT relationship is also further reviewed critically in this section, followed by a look at building of learning organisations and evaluation of their effectiveness.

Mapping KM

Despres and Chauvel (2001) have reported on the research programme undertaken by them to explore various aspects of applied KM by analysing various reports, cases, analyses and projections in the KM field. They have developed a classification scheme for KM work based on four dimensions: *process, type, level* and *context.*

Process

Somewhat similar to the process classification given by the Gartner group, the knowledge processes suggested by Despres and Chauvel are:

- Scanning/ mapping: the world of business intelligence, perception
- Acquiring/ capture/ creation: the world of research, development and creation
- Bundling/ packaging/ storing: the world of codification, representation, databases, info-bases, knowledge bases, memory
- Sharing/ applying/ transfer: the world of competencies, teamwork, intranets and sharing across borders.
- Transforming/ innovating/ reuse- evolving: the world of leverage, intellectual assets and innovation

Type

Knowledge is not a simple, stable quantity. Different schools of philosophy and sociology give different accounts. Currently, the importance of tacit and explicit knowledge is recognised by managers and is the subject of considerable research within KM. The difference between these two types has already been studied.

Level

The significance of the three levels of social aggregations – individuals, groups and organizations – which are important particularly in knowledge intensive organizations – is already familiar in management studies. This is because most individuals in knowledge intensive organizations work in groups, using resources provided by the

organizations. Hence this interplay of the three levels becomes crucial for evaluating the performance.

Context

The importance of an organisation's context – which influences its systems, structures and expectations – is increasingly cited in KM literature. Whether a piece of information is meaningful or not depends on its context. KM efforts should begin by specifying their context(s) and build from there

The above four dimensions create a map that positions most of the KM practices being applied by various firms. Figure 3.1 below illustrates the manner of positioning of KM activities of different firms with examples of Dow Chemicals, Buckman Laboratories and Hughes. Each cell is partitioned to include both tacit and explicit knowledge, and the overall framework is embedded in a context, which varies according to the analysis being carried out.

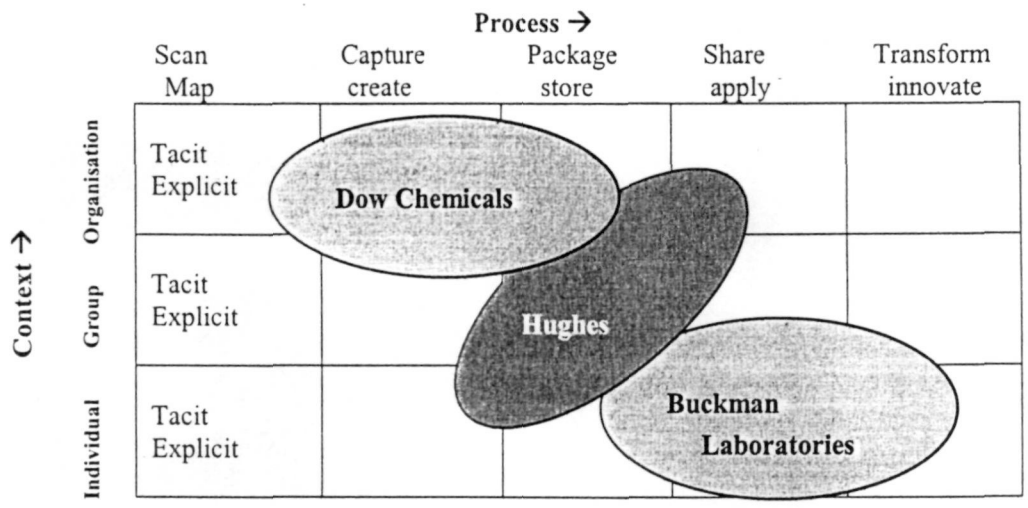


Figure 3.1: Illustrative KM Positioning of Different Firms[1]

By plotting various KM activities on the map it becomes possible to define regions in which the different practices and processes cluster, as shown in Figure 3.2. Since few

[1] Source: Despres & Chauvel, How to map knowledge management, *Business Standard,* January 5, 2001

companies restrict themselves to a single cell, these regions correspond to the ways companies actually use KM.

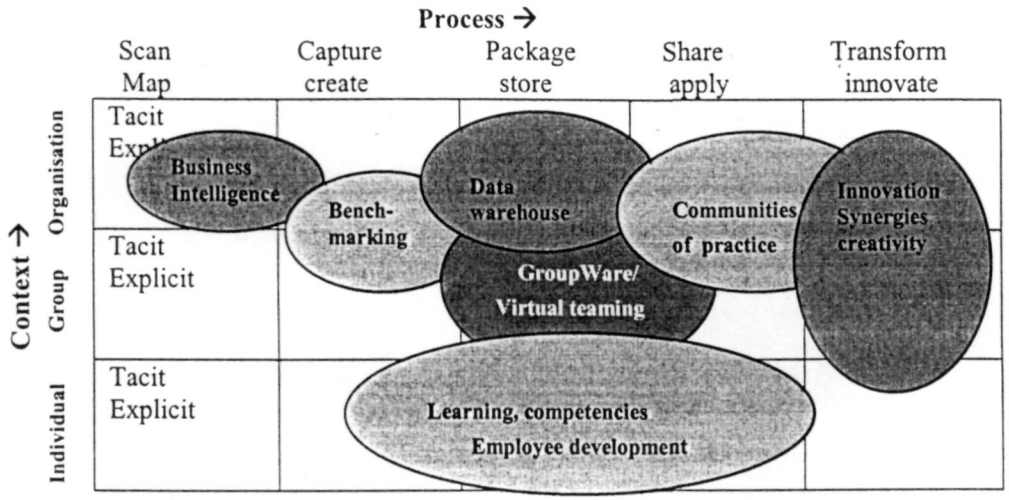


Figure 3.2: Positioning of KM Activities: Process vs. Context[2]

The point made by Despres and Chauvel is that KM covers the range of activities depicted in the map. KM comprises more than GroupWare or an Intranet (group level/ package-store and share-apply), more than business intelligence (organisation level/ scan-map) and more than a database of employee CVs (individual level/ package-store). The KM map is a chart of the feasible range of KM application options, a navigation tool for implementation of KM in stages.

For most of its existence, KM has been rooted in the individual and his or her behaviour. With the formalisation of this field, attention is now shifting towards the systems and structures that encourage knowledge-intensive behaviour in a company – the generation, transfer, application and reinvention of knowledge – occasioned mostly by new information technologies. This KM mapping facilitates managers of various companies to visualise the ground their KM programmes are covering.

[2] Source: Despres & Chauvel, *ibid.*

KM & IT

While explaining the KM concepts in previous chapter, need for deeper understanding of the KM-IT relationship emerged. In particular, differences between a KM system and the enabling IT infrastructure components like Intranet, GroupWare or Data Warehouse were illustrated. This issue however needs elucidation, based on further literature study.

Krishna (2000) has noted that KM has to be enabled by Information Technology *rather than driven by it.* An IT-oriented approach to knowledge management merely offers a combination of alglorithms, structures, tools and techniques. This approach "misses the woods for trees". This is because relevant knowledge often rests with the creative and intellectual individuals of an organisation, rather than only in documents and databases. Hence Krishna opines that approach towards KM should be more holistic and people-focused, and the bahavioural aspects should not be lost sight of.

On the similar note, Arora (1998) states that in IT function, the "T" representing "technology" is no longer the critical factor for success. The "T" matters more now if it represents "transformation", for which the limiting factor is the people's ability to change, not technology. Arora further notes that handling resistance to change and making the organizational culture more conducive to change has emerged as the most critical human-centered challenge. For the knowledge-based organizations like consulting firms, this aspect assumes importance while evaluating and measuring the business performance.

McCampbell et al. (1999) have written about the fundamental differences between KM and IT and quoted from Sveiby (1997) that the confusion between knowledge and information has caused companies to sink billions of dollars in IT ventures that have yielded marginal results. They contend that business managers need to realise that unlike information, knowledge is embedded in people, and knowledge creation occurs in the process of social interaction. It is further noted that technology is a key enabler for the implementation of KM. IT's role is emerging as an integrator of communication technology, rather than solely a keeper of information. The critical

role of IT lies in its ability to support communication, collaboration, and search for knowledge and information, not static repositories of "best practices".

Most KM applications have evolved from managing documents, databases workgroups and customers to managing contexts. KM systems do more than track or store information. With collaborative group support provided by IT infrastructure, employees in a firm take part in virtual teams; brainstorm, develop, present and deliver knowledge; share documents or applications; discuss and manage projects; and coordinate activities. IT tools and solutions facilitate this.

IT Tools & Solutions for KM

The seven-layer KM system architecture explained earlier in last chapter provided a guideline for the choice of technology components that enable effective sharing of knowledge across a distributed enterprise. Putting in place architecture like this just ensures that the technology building blocks (including the hardware equipment) are available for further building the KM applications required for the enterprise. The specific capabilities of the KM system being developed for an enterprise in turn are dependent on specific IT tools and solutions.

Intel (2001) in a 'white paper' on *Knowledge Management in the Internet Economy* has given an overview of IT tools and solutions being adopted for new and emerging KM applications. Table 3.1 below depicts a KM technology roadmap – summarising some of the KM capabilities and corresponding technologies – existing today as well as emerging.

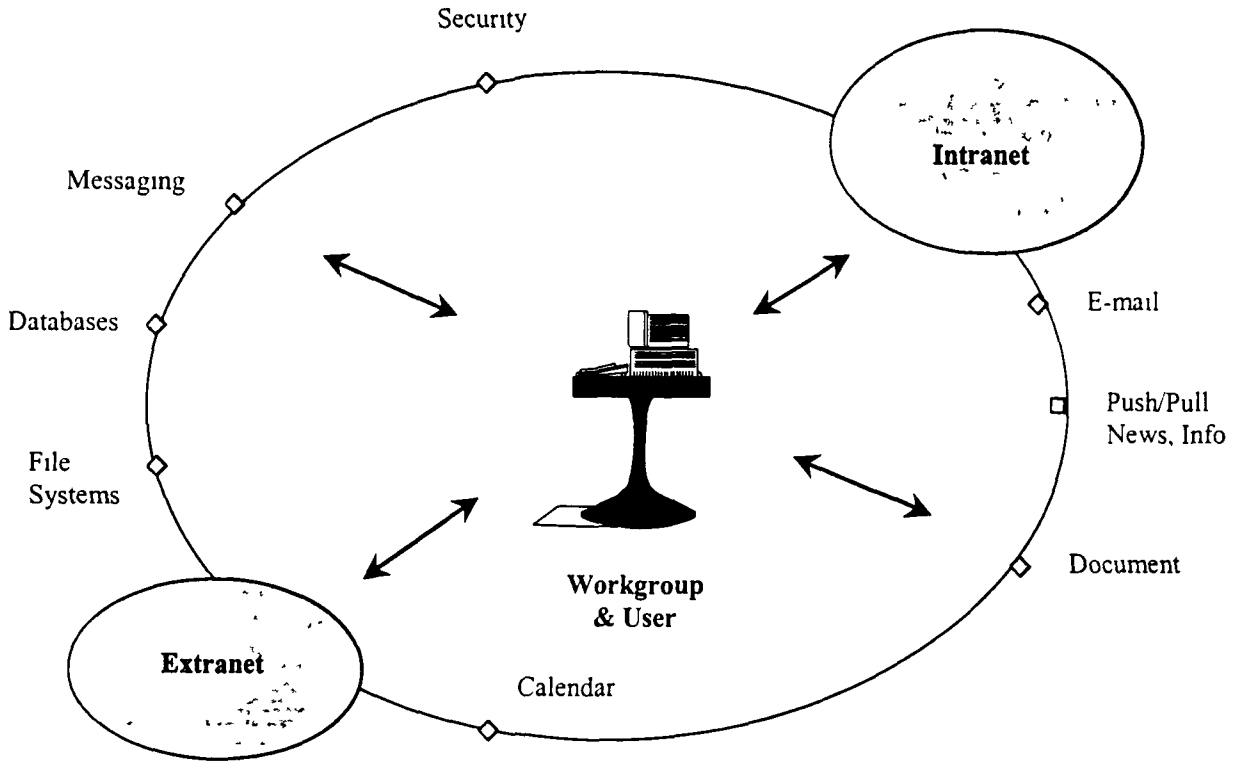
Table 3.1: KM Technology Roadmap

Today and Near Term	*Emerging*
KM Capabilities: *Organises information* ▪ Abstract and interact with static documents to provide active personal information ▪ Uncover relationships and patterns ▪ Organise and tag information ▪ Collaborate ▪ Data mining and analysis	***KM Capabilities:*** *Manages information and adaptively discovers knowledge* ▪ Adaptive information access and analysis from disparate information sources

Technologies: Intelligent interfaces and XML	*Technologies: Profiles to configure workspace*
▪ Visualisation, natural language processing ▪ Rule-based analysis ▪ Pattern matching ▪ Automatic tagging ▪ Intelligent agents for greater ease of use	▪ Monitors users, clusters data by user preference ▪ Software agents simulate business processes ▪ Context-sensitive searches ▪ Multi-language searches ▪ Platform security

The implications of the new KM technologies for a company's IT infrastructure are also described by Intel in its white paper. Implementation of KM implies a new role for the personal computer. In a company deploying KM system, the PC is transformed from a personal productivity and communications tool into a platform for Internet productivity, knowledge assimilation and e-Business success. Figure 3.3 below depicts such an environment where the PC functions to help businesses manage information overload and capture the value of the unstructured data and structured information that are the wellspring of e-Business success.

Figure 3.3: PC as the Knowledge Assimilation Platform in e-Business[3]



[3]Source: Intel (2001), *Knowledge Management in the Internet Economy Leveraging Knowledge for e-Business Success*, Intel Corporation

As a client device, it has sufficient performance to support the rich personalisation capabilities that enable users to customise the way information is collected and presented to them. These must also provide the performance to keep track of personal information and enable users to deploy integrated applications that focus on the individual user and "private user actions" – including performing micro-analysis of data.

The 'rich' client PCs in a balanced information infrastructure should have features and capabilities to support advanced KM applications as a complementary functioning of powerful, scalable servers gathering information and providing consolidated computing. The servers are the logical place to deploy applications such as business intelligence and enterprise information portals that focus on enterprise-wide intelligence, "public" user actions and data that must be accessed widely throughout the organisation. They are also well suited for performing macro-level filtering of Web and enterprise content. Intel has provided examples of KM capabilities that are effectively executed at either the client or server in Table 3.2.

Table 3.2: KM capabilities executed at client or server end

KM Capability	Description	Benefits
Server-side Computing		
▪ Enterprise/ Web Content Categorisation	Content-based relevancy analysis of enterprise information	Intelligent categorisation; Faster information access; Broader access to information
▪ Experts/ Communities Database	Information on knowledge sources	Leverage existing knowledge and the experience of others
▪ Server User Profiling	Basic tracking of interests and behaviour of user visiting a particular site or information source	Some personalisation, but limited to a particular site or data source

Client-side computing ▪ Intelligent Information Retrieval	Use-aware search agents retrieve relevant information in advance	Information available when needed, No downloading wait
▪ Personal Content Categorisation	Content-based relevancy analysis and clustering of personalised information	Greater personalisation, higher productivity
▪ Information Consolidation	Single interface for tracking and indexing all user-relevant information	Information is all at one place; Access to broader information
▪ Information Visualisation	3D rendering of structured and unstructured information such as 3D graphing and relationship mapping	Understand larger volume of information in shorter time; More intuitive and interactive
▪ User Learning and Adaptation	Agent on client "watches" and learns user behaviour, interests and current context	PC can understand and anticipate user needs; User can delegate tasks to PC
▪ Natural Language Processing	Speech user interface and handwriting recognition	More intuitive and interactive, Dynamic information sharing to enhance collaboration
▪ Notification	Client agent unobtrusively notifies user of information relevant to current system and context	Use gets the right information at the right time

In a nutshell, the point made in the Intel literature is that KM applications of today and near future require a balanced technology infrastructure consisting of rich client PCs, powerful scalable server platforms and allied IT tools and software solutions. KM rides on IT infrastructure; one is not to be confused with another.

Learning Organisations

Like Knowledge Management, the term "Learning Organisation" too has not been able to get a single definition acceptable to all researchers. Though most scholars view organisational learning as a process that unfolds over time and link it with knowledge acquisition and improved performance, they differ on important matters.

Some, for example, believe that behavioural change is required for learning; others insist that new ways of thinking are enough. Some cite information processing as the mechanism through which learning takes place; others propose shared insights, organisational routines, and even memory. For most scholars, however, learning organisations have often acquired a mystical, reverential or utopian status. Two of these scholars deserve particular mention here.

Peter Senge[4], who popularised learning organisations in his book The Fifth Discipline, described them as places "*where people continually expand their capacity to create the results they truly deserve, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.*" To achieve these ends, Senge suggested the use of five "component technologies": systems thinking, personal mastery, mental models, shared vision, and team learning. Similarly, Ikujiro Nonaka (1991) has characterised knowledge-creating companies as places where "inventing new knowledge is not a specialized activity...it is a way of behaving, indeed, a way of being, in which everyone is a knowledge worker." Nonaka suggested that companies use organisational redundancy to focus thinking, encourage dialogue, and make tacit, instinctively understood ideas explicit.

Though sounding idyllic, the recommendations made by both are far too abstract and leave too many questions as unanswered. How, for example, will managers know when their companies have become learning organisations? What concrete changes in behaviour are required? What policies and programmes must be in place? How does one get from here to there? These critical issues - essential for effective implementation of KM programmes at the practical level - are mostly left unanswered in contemporary literature.

Garvin (1993) has attempted to tackle the issue of defining, building and nurturing a learning organisation at a somewhat more practical level. He has identified the three critical issues which must be addressed before a company can truly become a learning

[4] Quoted in Garvin (1993)

organisation. First is the question of *meaning*: a well-grounded, easy-to-apply definition of learning organisation. The definition given by Garvin is as follows:

> " A learning organization is an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights."

The second issue is *management:* clearer operational guidelines for practice. He mentions that learning organisations are skilled at five main activities:

1. Systematic problem solving
2. Experimentation with new approaches
3. Learning from their own experience and past history
4. Learning from the experiences and "best practices" of others, and
5. Transferring knowledge quickly and efficiently throughout the organisation.

A distinctive mind-set, tool kit, and pattern of behaviour accompany each of above organisational skills. By creating and *managing* systems and processes that support these activities and integrate them into the fabric of daily operations, companies can manage their learning more effectively.

The final critical issue mentioned by Garvin is a framework of better *measurement* tools to assess an organisation's rate and level of learning. As is said often, you can't manage something if you can't measure it; so a complete learning audit measuring behavioural and cognitive changes as well as tangible improvement in results, is suggested by him. The framework using "three Ms" proposed by Garvin is potentially interesting for present research.

Wick (1993) has given an interesting "Formula" for a learning organisation – with each element of the formula as "absolutely mandatory". He states that:

> "Learning Organization =
> Leader with Vision **X** (Plan/ Metrics) **X**
> Information **X** Inventiveness **X**
> Implementation"

The second element of above formula is of current research interest. Learning organisations should rigorously measure their progress with a framework of detailed metrics and hold themselves accountable. The breadth of the vision, the details of planning, and the feedback from the metrics drive the inventiveness and implementation in the final factor of the formula.

3.3 KM in Consulting Companies

The next stream of literature reviewed pertains to the application of KM in consulting organizations. There is a high level of interest in KM amongst consulting firms as they see the capacity to compete on the basis of accumulated knowledge as being a defining feature of their business. Consulting firms cite KM as a core capability for achieving competitive advantage and consistent with this claim has been their increasing investment in KM systems enabling the firms to leverage the knowledge held by them. The literature study supports this seriousness of purpose of KM in consulting firms.

Dunford (2000) has listed key challenges in the search for the effective KM in management consulting firms. While reviewing the applications of KM in some leading consulting companies he has commented on the rather high investment already being undertaken on KM work. For example he reports that McKinsey and Company spends about 10% of its revenue on KM and Ernst & Young spends about 6%. He has observed a large variation in the level of use of, and contribution to, KM systems. There are a

number of reasons listed in his paper why developing a smooth and effective KM system represents a considerable challenge. The performance evaluation has been one of the key challenges because of the inherent conflict of interest between maximising the employee's own perceived competencies and maximising the organisational level knowledge base of the firm and the critical role of knowledge sharing from an individual employee to another.

He has concluded that despite the wide pervasiveness of the view that KM is a core component of competitiveness, its specific contribution to revenue is very difficult to determine.

McCampbell and others (1999) have very briefly outlined the KM efforts in four top consulting organisations – Teltech, Microsoft, Ernst & Young and Hewlett Packard - and have recommended steps for implementing KM strategy in consulting organisations. Though measuring performance of KM practices has been given as one among the final 'on-going' steps for KM implementation, nothing has been said on how to go about it. The following extract from the paper reminds about the existing gap in research in the subject of present study – particularly focussed on consulting firms:

> " . Performance measurement will be a key issue in knowledge management initiatives since there is little precedent upon which to establish ROI. As an emerging and dynamic discipline, the creation of a standard measurement of knowledge reflected on the balance sheets, is still in the formation stage Once achieved, the result will be a rapid response from global business leaders to implement knowledge management "best practices" in order to remain competitive "

Faizal (2001) has also mentioned about ROI measurement effort - particularly in Teltech - through a technique called "Infonomics" which helps an organisation to find a quantifiable return on KM. However the details of this technique are not given.

The work of Hansen et. al. (1999) published in *Harvard Business Review* titled "What's your strategy for managing knowledge?" is a sort of milestone towards the subject of current research. The two alternative approaches for KM application in consulting organizations – *codification vs personalisation* – depending on the

economic model and knowledge intensity in their operations, have already been explained in previous chapter. But the strategic impact of this paper for consulting firms deserves a special mention here because this has been one of the most-cited pieces of literature on KM applications in consulting firms. The authors have identified Anderson Consulting and Ernst & Young as the consulting firms following codification strategy; while McKinsey and Bain & Company represent personalisation approach for KM. Despite giving a very clear direction for the KM strategic approach for consulting firms, the authors however, haven't touched upon the area of KM performance measurement in the two different cases of KM strategic approaches.

Though not directed specifically to consulting organisations, Botkin (1999) has offered a 3x3 matrix approach (he calls this the "nine questions approach") for effectively "making, measuring, and managing knowledge communities"- which is of touching relevance for consulting companies too. One side of the 3x3 matrix comprises of "3Ks" (knowledge business, knowledge communities, and knowledge management), and the other is the "3Ms" (making, measuring, and managing). One of the nine questions formulated by Botkin relates to measuring KM and is reproduced below:

> " Who "owns" the KM system and to whom does he, she, or they report? Who takes action when the knowledge management system goes down?"

As a passing reference to consulting firms, the author just states that "Consulting companies in the knowledge business can measure the impact of their KM on their business: the number of new projects gained as a result of KM, the amount of time saved in creating new proposals for potential clients by using captured and catalogued former proposals." No concrete guidelines - excepting this - are offered by the author for KM application in consulting firms.

Funes and Johnson (1998) have mentioned different software packages, technologies and approaches to support KM with some "company examples of knowledge technology". As the only example of consulting company, the "Knowledge View"

implementation in Lotus Notes finds a mention in just half a page in the Appendix of their book.

A more informative and definitely more detailed description of KM application in a consulting organisation is given as a "Case Study" by Rana (2002). The KM strategy adopted by Ernst & Young India, based on the codification of knowledge resources has been outlined by Rana. But here too, the answer to *how* Ernst & Young meaures its KM performance, is missing.

As the chairman of another revered consulting company, Murthy (2001) has spoken about the relevance of the company's value system, apart from the speed, imagination and excellence in execution, as the attributes of a successful firm like Infosys. But he doesn't comment on the KM performance evaluation process in his company.

Finally a documentation of KM case studies covering company-specific as well as industry-specific available at ICASIT's website (2001) provides a reference point for getting awareness about the extent of application and evaluation of KM in consulting companies. Unfortunately however, no Indian consulting company finds a mention here and so this was not of much help for present research.

3.4 KM Performance Measurement

This stream of literature formed the core of the literature study activity for this dissertation. The research framework and the design of primary data collection schedules got inspired from some of the sub-areas as follows:

Drawbacks of the Present KM Measures

On the measurement and evaluation of KM's business impact, Tiwana (2000) reports that despite his research on several companies that have been successful in implementing KM, he has "*yet to come across one that has a strong measurement program in place.*" Some companies like Buckman Laboratories, Canon, Skandia and Dow Chemical have begun to measure their Intellectual Capital (IC), with the belief that growth on this front is often a good indicator of future financial health. Though measuring IC is a growing

area of interest in KM field and metrics are being developed and applied by some of these firms, more representative KM performance measures are needed which do not have the "drawbacks" of the existing traditional metrics like financial ROI, Tobin's q or total cost of ownership (TCO).

No metric is better than the one that is *absolutely wrong*. A choice of wrong metric can have more ill effects than positive ones. Metrics, when applied to knowledge work are vulnerable to the following common pitfalls, as also mentioned earlier in Chapter 2:

- Using too many metrics
- Delayed and risky rewards tied to metrics
- Choosing metrics hard to control
- Choosing metrics hard to focus on
- Choosing metrics that neglect the "soft results" or intangible outcomes
- Choosing metrics that are too rear-view oriented
- Measuring the wrong things.

The last one needs further elucidation. A manager or employee will tend to maximise the metrics that are actually measured. If a manager is told that a high market share for a product indicates brand value, he will try to maximise the market share of that product, even though quality (not measured) might be equally important. Figure 3.4 given below illustrates this concept.

If, in the figure below, of all five important metrics A, B, C, Y, and Z, only three (A, B, and C) are actually measured, employees will focus only on those and simply ignore Y and Z, however important they might be. Managers and employees who maximise A, B, and C will be rewarded for their performance even if Y and Z go to dogs. Soon, the entire company or department is focussed on improving the metrics that are actually measured, as they alone provide an indication of the value of their work. If A, B, and C lead to productive results, then the metrics are considered effective. If they fail to produce good results, they are considered ineffective. The problem begins when the employees fear to

change course from the existing chosen metrics - because of tremendous individual and organisational inertia.

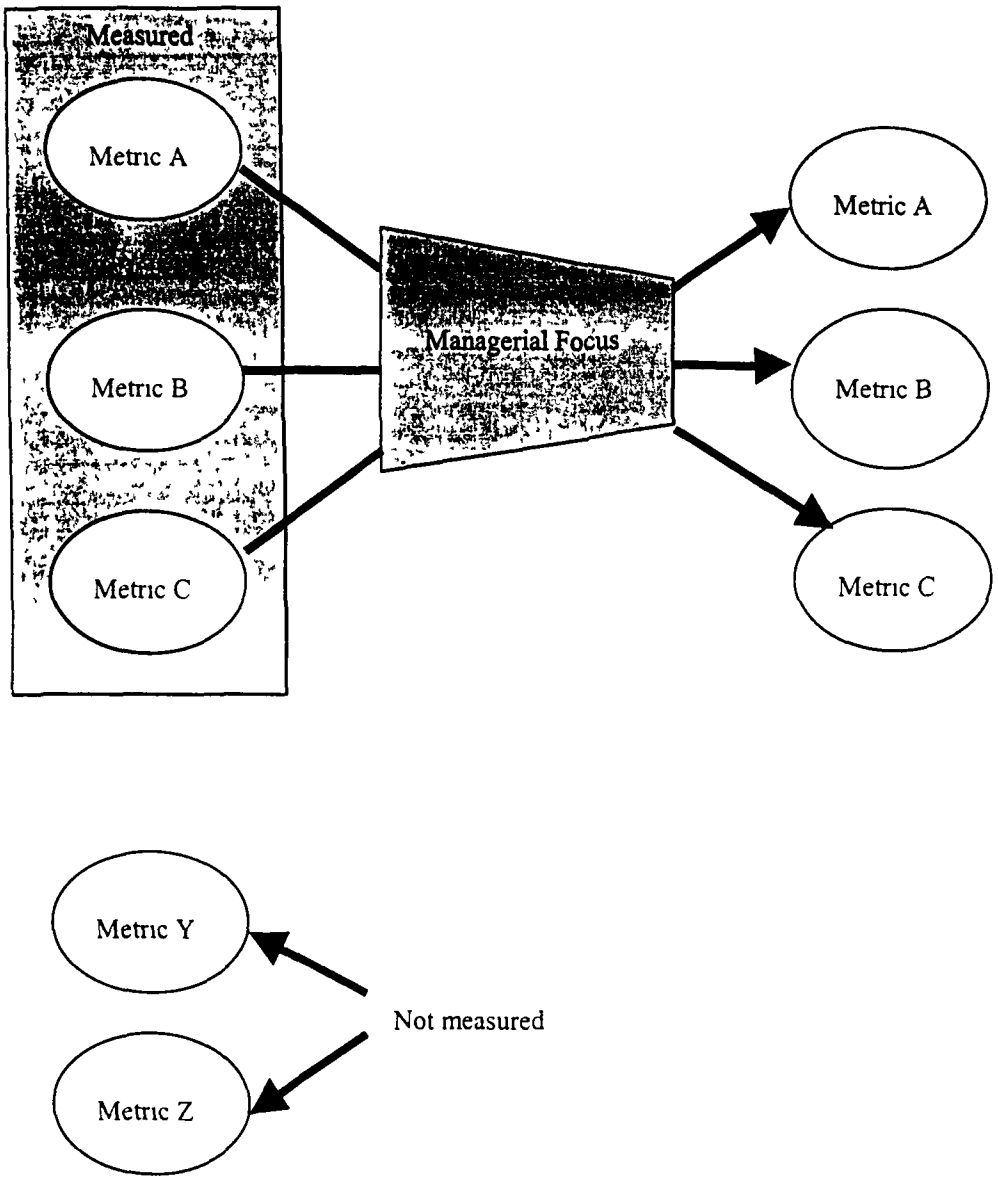


Figure 3.4: Only measurable metrics can be controlled

Knowledge sharing and creation often tend to be akin to metric Y – ignored and little rewarded. Some leading knowledge-intensive companies, on the other hand, have included knowledge sharing and creation in their repertoire of critical metrics. Every employee's compensation is, in part, determined by the amount of knowledge that the employee adds and the frequency with which other employees refer back to that

contribution. Choosing the right metrics is therefore critical both to evaluate the performance of your KM strategy and to make it work in the first place.

Intellectual Capital (IC) & its Measurement

Petty & Gutherie (2000) have done extensive review of research on measurement, reporting and management of IC. They have first attempted to clarify the delineation between the terms KM and IC by a simple statement that "Knowledge management is about the management of intellectual capital controlled by a company. Knowledge management as a function, describes the act of managing the object, intellectual capital." However this simplistic view of KM as just managing the IC assets of a company has some flaws (for example, is knowledge a "stock" or "flow"?) pointed out by other researchers as reviewed later.

They have mentioned that the question, "What is intellectual capital?" itself has been seldom adequately addressed. Even the most workable definition of IC offered by the Organisation for Economic Co-operation and Development (OECD) as "the economic value of two categories of individual assets of a company – organisational capital and human capital" does not include some intangible items like a firm's reputation. Reputation may be a by-product or result of the judicious use of a firm's IC, but it is not part of IC *per se.* However, the distinction between intangible assets and IC has still been vague at best. "Goodwill", for example, is an intangible asset, as well as a component of IC.

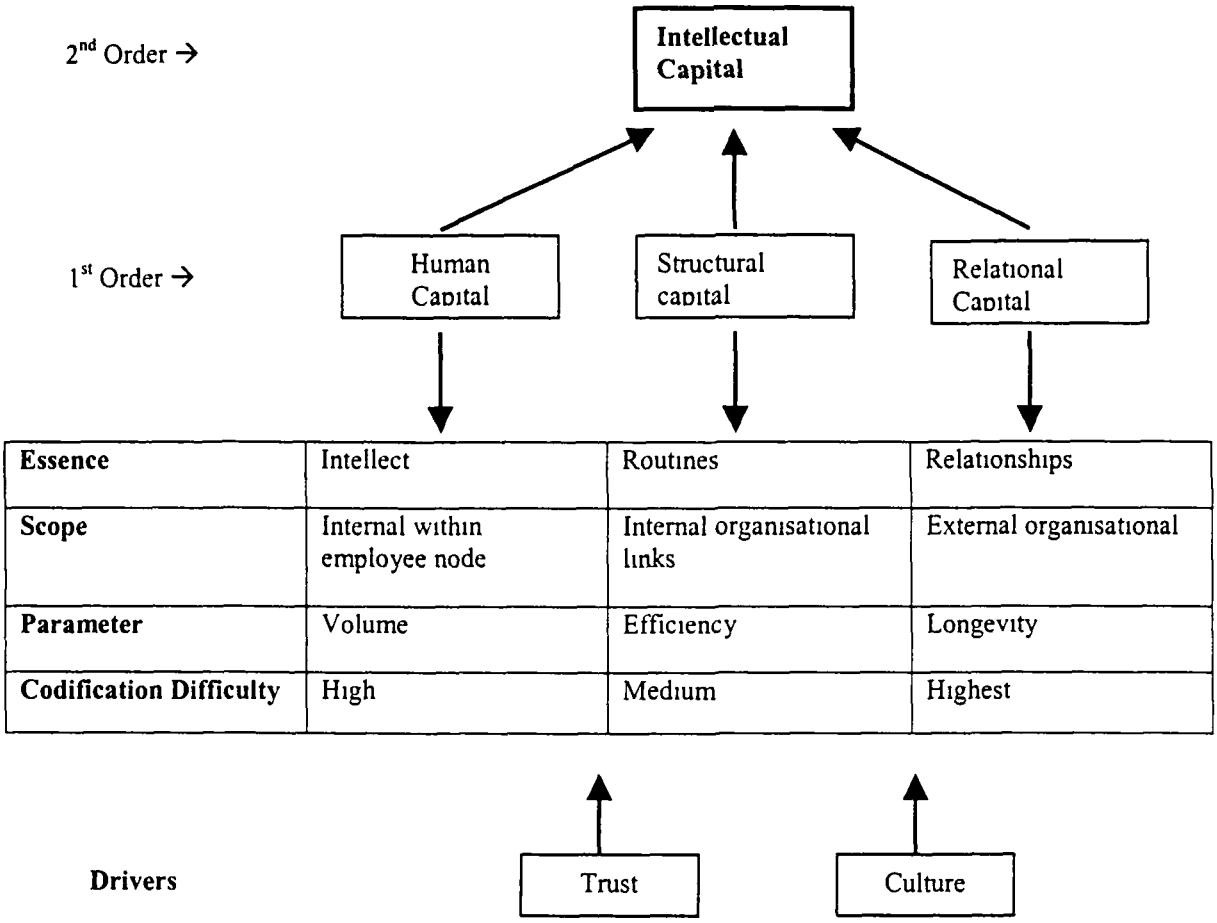
Traditional accounting practice does not provide for identification and measurement of "new" intangibles in organisations. These "new" intangibles such as staff competencies, customer relationships, models, and computer and administrative systems receive no recognition in the traditional financial and management-reporting model. Even traditional intangibles like brand equity, patents, and goodwill are reported in financial statements only when they meet stringent recognition criteria. These limitations of existing reporting have led to new attempts to measure and report by synthesising the financial and non-financial value-generating aspects of the company.

Liebowitz and Suen (2000) have discussed on the current metrics for measuring intellectual capital and the need for additional metrics. They have indicated the need for more research to better define the new performance measures for knowledge work, for producing the most value-added benefits for the organization. In their review of existing metrics, "creativity" was cited as lacking for determining the size and growth of organizational knowledge base. As an example they have mentioned that rather than ROI, metrics like 'ROV' (Return on Vision) are being developed by consulting companies such as Andersen Consulting. This demonstrates a different mindset for performance measures rather than accounting-based measures like ROI.

Bontis (1999) has also evaluated the state of the IC field. He has brought out the limitations of the present literature stemming primarily from an accounting and financial perspective. The limitations of intellectual capital research not catering to the changes in cognition and behaviour of individuals - necessary for learning and improvement - have been emphasised. The view of treating knowledge as a static asset in an organisation provides a hindrance for evaluating and measuring the organisational learning processes which characterises knowledge as a "flow" process rather than a "stock" asset. He has given a conceptualisation of IC as a "second-order multidimensional construct" in which the role of trust and culture as the drivers for intellectual capital are necessary for innovation and competitive advantage of the firms. The three sub-domains of his conceptualisation of IC include human capital, structural capital and relational capital, as shown in Figure 3.5 below. He further notes that what the field needs at this point is a more concentrated focus on rigorous, metric development and quantitative evaluation.

At an international symposium on measuring and reporting intellectual capital organised by OECD in June 1999, a team of Swedish researchers presented an extensive overview of IC measurement models and some Swedish qualitative exploratory case studies. In their presentation, Johanson, et al. (1999) cited a classification scheme of IC and measurement of different intangibles developed by Roos & Roos (1997), which is similar to the conceptualisation given by Bontis above. As per them, broadly, IC classification comprises of Human Capital, Organisational Capital and Customer & Relationship

Capital. They have also cited Sveiby (1997) for his "intangible asset monitor" where the financial capital, customer capital, the organisation, and the people are measured by means of growth/ renewal, efficiency, and stability. The Swedish Public Relation Association (1996) proposes measurement of intangibles in five different segments: leadership, market, finance, employees, and community. Kleinwort Benson from The Conference Board (1997) used 20 measures grouped into four major categories: growth measures, client satisfaction measures, marketing and sales measures and business management.



Essence	Intellect	Routines	Relationships
Scope	Internal within employee node	Internal organisational links	External organisational
Parameter	Volume	Efficiency	Longevity
Codification Difficulty	High	Medium	Highest

Figure 3.5: Intellectual Capital: Multidimensional Construct

While referring to all these IC classification and measurement schemes, Johanson's research team has concluded, "*although there is no shortage of proposals dealing with measurement of intangibles, the extent with which these models are actually practised remains obscure.*"

Performance Measurement Challenges

Neely (2002) in his interview to *Emerald Now* talks about the practical challenges in design and implementation of performance measurement systems. Different challenges are associated with four fundamental processes of performance measurement: measurement system design, implementation, managing through measurement, and 'refreshing' the measurement system. In design, the challenge lies in choosing the right and vital measures and avoiding *excessive* measurement. At implementation stage, the challenges are two fold. There is the data access issue, i.e. the need to get access to the right data, and the political and cultural issues, notably people's fear of measurement and the games they consequently play to try to manipulate target setting. To combat this, people inside organisations need to be educated to understand the purpose and use of the measurement system

The challenge in managing through measures requires a cultural shift in many organisations. Education is required in how to present data focussed firmly on targets, rather than in a way where individuals can interpret to suit their own interests. The last challenge is for providing continuity of the new measurement systems.

While reviewing literature on performance measurement, an interesting measurement framework "The Performance Prism" developed by the Centre of Business Performance at Cranfield School of Management in cooperation with Anderson Consulting deserves special mention. Neely & Adams (2001) have proposed a broder stakeholder view for performance measurement in "The performance Prism" framework. An important distinction is made between *contribution* of different stakeholders from their expected *satisfaction.* Table 3.3 illustrates this difference.

Table 3.3: Stakeholder Views: Contribution vs. Satisfaction

Stakeholder Satisfaction *(Stakeholder Wants & Needs)*	**Stakeholders**	**Stakeholder Contribution** *(Organisation Wants & Needs)*
"Fast, Right, Cheap & Easy"	*Customers & Intermediaries*	Trust, Unity, Profit & Growth
Purpose, Care, Skills & Pay	*Employees*	Hands, Hearts, Minds & Voices
Trust, Unity, Profit & Growth	*Suppliers*	Fast, Right, Cheap & Easy
Legal, Fair, safe & True	*Regulators & Communities*	Rules, Reason, Clarity & Advice
Return, Reward, Figures & Faith	*Investors*	Capital, Credit, Risk & Support

While bringing in the different stakeholders' viewpoint in the performance measurement and distinguishing between the wants and needs of stakeholders from the organisation, the concept of this framework can be usefully exploited for newer KM performance measures.

Emerging IC/ KM Measures

Macdonald (1999) has not proposed any new performance measures for KM. However his emphasis on a thorough assessment of the organisation for the prevailing culture and knowledge base is quite relevant. He has in fact, stressed on going in for a rigorous cultural and knowledge assessment *before* implementing the KM programme in the organisation. The steps for this assessment preparatory to KM implementation cover:

- A detailed assessment of where the organisation stands in relation to knowledge
- An assessment of the current culture or environment for change
- As assessment of the current IT position
- Defining a purpose or strategic statements on knowledge and competence requirements

- A holistic measure of the delta or the difference between where we are and where we want to be.

Though the effectiveness of KM performance measures is normally a subject of post-implementation stage, the above nevertheless give useful insights to what should be the contributory factors for creating a framework of effective KM metrics. On a similar plane Koulopoulos and Frappaolo (1999) have also advocated for a 'knowledge audit as a good first step' to get an overview of the strengths and weaknesses of the company, before attempting full scale KM implementation. An effective KM audit provides the benchmarks of successful KM implementation within the organisation. Of course, these benchmarks would always be in a constant state of flux. The KM audit is to be used on an ongoing basis to continuously profile the changing competencies and re-mapping these to the entire enterprise, for continuous knowledge improvement. They have suggested the following dimensions for an effective KM audit:

- Structure
- Culture
- Process
- Technology
- Innovation
- Communication
- Team Strategy
- KM practices

Foote et al. (2001) have referred to Saba, a company specialising in learning and performance management software. This company has started to employ measures such as customer retention, employee retention, revenue per account executive, speed to market, time to competence and time to meet customers' needs for measuring the influence of intangible KM assets in the company. Though correlating these

outcomes solely to KM would not be accurate (and fair), Saba's chief learning officer Brook Manville adds, "if you are tracking them, you ought to see a positive impact". On KM measures, the authors cite, "when hard metrics are not available, knowledge managers can use anecdotes to convey the commercial value of their discipline." This is because "stories do a better job of showing people what knowledge management can accomplish than do metrics, which remain crude."

Amidon (1997) has stressed on "Knowledge Innovation Assessment" of internal capabilities of the firm through a set of introspective questions as follows:

1. Is the business strategy known and is it clear? Who is responsible for performing the assessment?
2. Are the performance measures designed to gauge the qualitative as well as the quantitative indices of the enterprise?
3. Are the measurement systems created as an end or a means to promote value in the eyes of the customers and stakeholders?
4. Is the instrumentation in place (e.g., metrics, reports, technologies) to ensure proper, consistent calibration over time?
5. Is the measurement process perceived as a punitive (i.e., command-and-control) or learning activity?
6. Are there incentive/reward mechanisms to promote idea creation, responsible risk-taking, and application into products/services?
7. Have you a means to define and measure the intangible assets (i.e., intellectual capital, value of collaboration/interaction, degree of contribution) of the enterprise?

Wijnhoven (2001) has proposed a framework for stakeholder-based knowledge valuation in organisations, somewhat similar to the concepts given by Neely, mentioned earlier. He has summarised, as shown in Table 3.4 below, the relevant knowledge valuation methods for various shareholders and their contribution to the organisation. The knowledge value measures proposed by him give certain concrete ideas for an effective framework of KM performance measures.

Table 3.4: Knowledge Valuation for Different Stakeholders

Stakeholder	Contribution	Knowledge value measures
Employees	Labour	▪ Income gaining value ▪ Income guarantee value; Employment security value ▪ Friendship ▪ Prestige; Power ▪ Achievement; Growth
Customers	Turnover	▪ Product component excess; Knowledge features ▪ Value of marketing; Learning curve price discounts
Suppliers of goods and services	Raw materials, other products, services	▪ Payment processing efficiency ▪ Product adoption capability
Suppliers of capital	Capital	▪ Market-to-book value ▪ Calculated intangible value; Sales value of knowledge ▪ Tobin's *q*
Top management	Generating Return on Management (ROM) to sustain the co-operative system	▪ Cultural capital, Client perceived skills need ▪ Process benchmarking ▪ NPV of knowledge investments; Value chain needs ▪ ROM; Exploitation ratios, Replacement value

Wijnhoven has further cross-classified the knowledge valuation methods proposed by him with different categories of knowledge, as shown in Table 3.5 below.

Table 3.5: Knowledge Valuation for Different Categories of Knowledge

High integration of values	Norms and values; paradigms Qualitative and shared non-accounting measures	Patents, licenses and information products Quantitative, accounting-based valuation; exchange values
Low integration of values	Skills Individual employee measures	Patents, licenses and information products Exchange values Norms and values paradigms to detect and correct cultural misfits
	Tacit knowledge	**Explicit knowledge**

In a report sponsored by the Centre for Business Performance of the Institute of the Chartered Accountants in England and Wales, Leadbeater (1999) has given an overview of the possible "new measures for the new economy", presented at the International Symposium on Measuring and Reporting Intellelctual Capital held in Amsterdam in June 1999. Besides the Cash Flow Measures, other new performance measures mentioned by them include Economic Value Added (EVA), the Balanced Score Card (BSC), Ethical and Social Auditing, Environmental Auditing and certain new IC measures including Human Capital, Customers as assets, Brands, R&D, Intellectual Property, Patents etc. Though no specific framework has been given for bringing all these new measures together, he has cited evidence of such industry specific, non-financial measures to put more reliable value on intangibles. He has concluded that patent citations, some aspects of R&D, customer satisfaction and loyalty, human capital and brand values, can all be systematically linked to stock market valuations given to companies, making such non-financial information as highly "value relevant".

Talking of EVA, Pettit (2001) has illustrated the EVA approach for business performance evaluation as a move beyond the traditional focus of margins and earnings. EVA approach essentially accommodates capital utilisation and the intangible capital for

performance measurement. However other researchers like McConville (1994) and Ochsner (1995) have warned about some implementation drawbacks of EVA measure. Even though EVA makes useful adjustments for decision making, no clear instructions for working level implementation for individual level contribution are satisfactorily available. Leadbeater (1999) has mentioned about the critics of EVA, who argue that it is still too historic a measure and does not provide any sense of linkages between a company's investment in intangibles and its financial performance. It is criticised for being biased against investments in intangibles. Regarding EVA's deployment in India, even for limited application initiated by a few consulting firms - including the top IT consulting company Tata Consultancy Services - this issue of implementation is still being grappled with[5].

Allee (2000) has mentioned "five intangible assets that people are now managing" in new balanced score cards, intellectual capital measures and bottom line reporting:

1. External relationship capital
2. Structural capital
3. Human capital
4. Social capital
5. Environmental capital

She maintains that bringing an intangibles focus to knowledge initiatives helps the managers to find the big value that is too often overlooked. For this one needs to calculate ROI in terms of both hard assets and financial gains as well as intangible gains. But no methodology for procedure bringing together the five intangibles specified by her are given.

Some other researchers have attempted either "frameworks" or "new" performance measures or "new metrics". Skyrme (2001) has suggested new metrics for managers in knowledge intensive businesses, abbreviated to the acronym ABBA.

[5] Source: Discussions with case study respondents from the firm

- Asset – focus on important, often intangible, assets; this focus also includes valuation of a company or parts of a company for mergers and acquisition, management buy-outs, and so on
- Baseline – benchmarking core activities against those of "best in class", not necessary in the same industry
- Benefits – understanding the casual relationships between activities and their outcomes
- Action – performance measurement with a view to prioritizing activities and driving management behaviour.

The baseline focus is examplified by benchmarking, in which an organisation evaluates the level and quality of its practices against other organisations. For knowledge intensive organisations, KM should also be one of the activities that organisations benchmark. Skyrme has given the following ten categories for benchmarking to diagnose and to direct attention to areas where better KM practice will make a difference.

1. Leadership
2. Measures
3. Processes
4. Explicit
5. Tacit
6. Culture/structure
7. Role/skills
8. Technology
9. Services
10. Image

He has further listed balanced scorecard also as one of the new baseline assessment measures. However Tiwana (2000) has excellently summarised the evolving metrics for knowledge work using these two techniques of benchmarking and balanced scorecard.

He has explained the benchmarking process in detail and shown it in a flow diagram format, as applied to knowledge work. Figure 3.6 shows the benchmarking process.

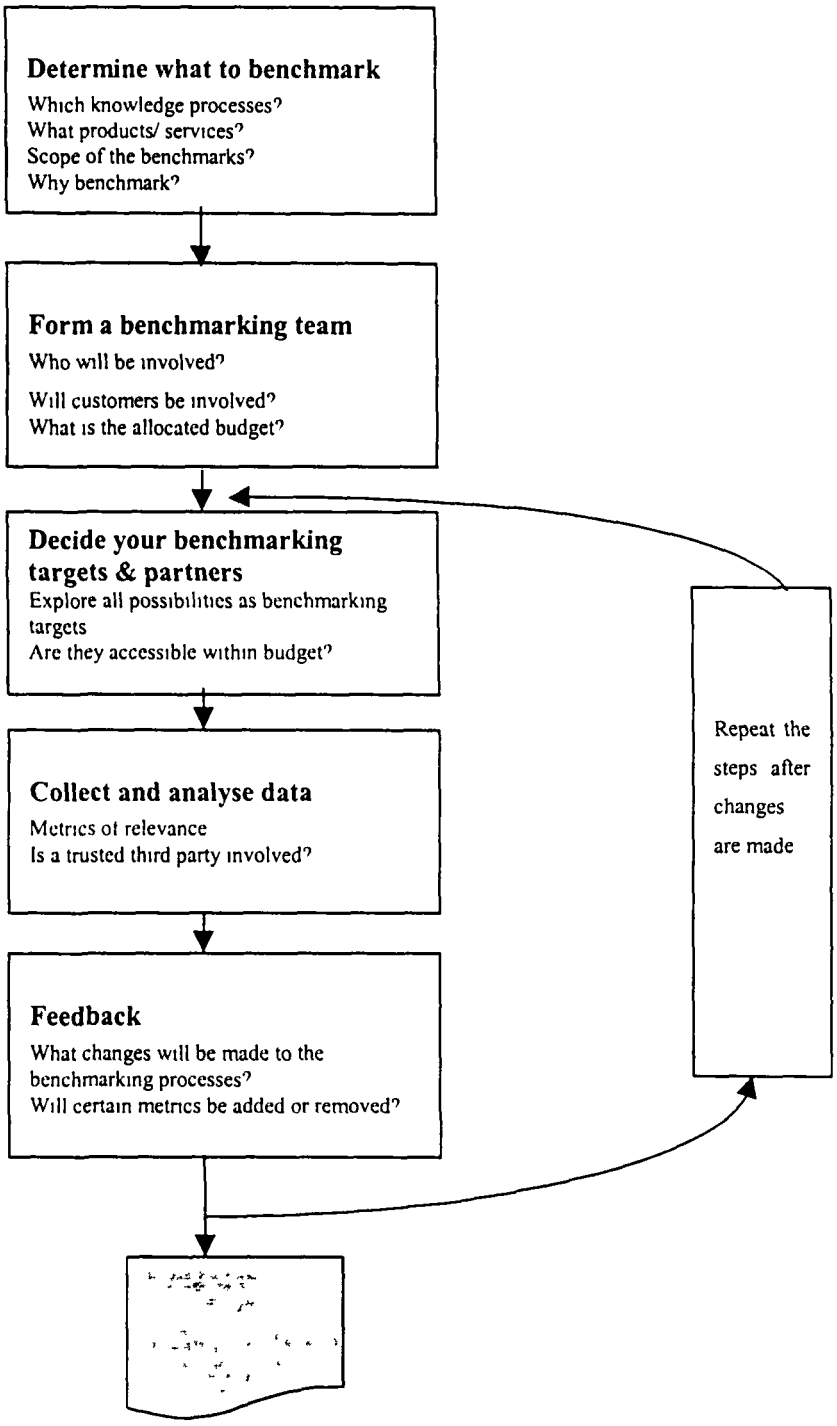


Figure 3.6: Benchmarking Process

Table 3.6 given below summarises possible targets against which a company should benchmark its KM initiatives. Other relevant targets can also be identified from the same company, from rival firms, from non-rival firms, or from averages representing the particular industry or sector. Each has its own benefits and downsides, and the choice, finally, is one of subjective judgement and weighted costs.

Table 3.6: Possible Benchmarking Targets

Benchmark Target	Upsides	Downsides
Other units within the company	This breaks down internal barriers to communication and conversation between various division and offices of the company; targets are easily accessible.	Internal policies might come into play; the measures are not indicative of what is considered superior performance by the company
Competing firms	The company is measured against its direct competition; the knowledge assets of the competitors as an aggregate are understood to a fair extent; partners can easily be identified.	Legalities can make this very difficult; if a trusted third party is brought in, additional costs are imposed.
Industry	All of the above; one also gets an idea of the company's standing in the overall market.	Can be very expensive; privacy issues begin to surface
Cross-industry	Valuable insights from non-competing firms can be gained for application to the company	All of the above; this doesn't help to gauge the company's competitive standing; the sample population doesn't represent the firm's own industry or sector; it's often difficult to get participation; the cost of such an effort is rarely worth it.

To enable the benchmarking process, a 'process classification framework' has been developed by American Productivity and Quality Centre (APQC) benchmarking clearinghouse. This framework represents only major business processes and sub-processes, not functions, through its structure and vocabulary. The framework does not list all processes found within any specific company. Likewise not every process listed in the framework is present in every organisation.

APQC model for benchmarking processes has been referred by Pancucci (2002) for measuring KM. Pancucci mentions the following five stages for development of KM measures based on APQC model:

1. Enter and advocate
2. Explore and experiment
3. Discover and conduct pilots
4. Expand and support, and
5. Institutionalise

Regarding the balanced score card technique (BSC), Figure 3.7 shows the basic scorecard for translating a firm's vision and strategy into actual goals and targets.

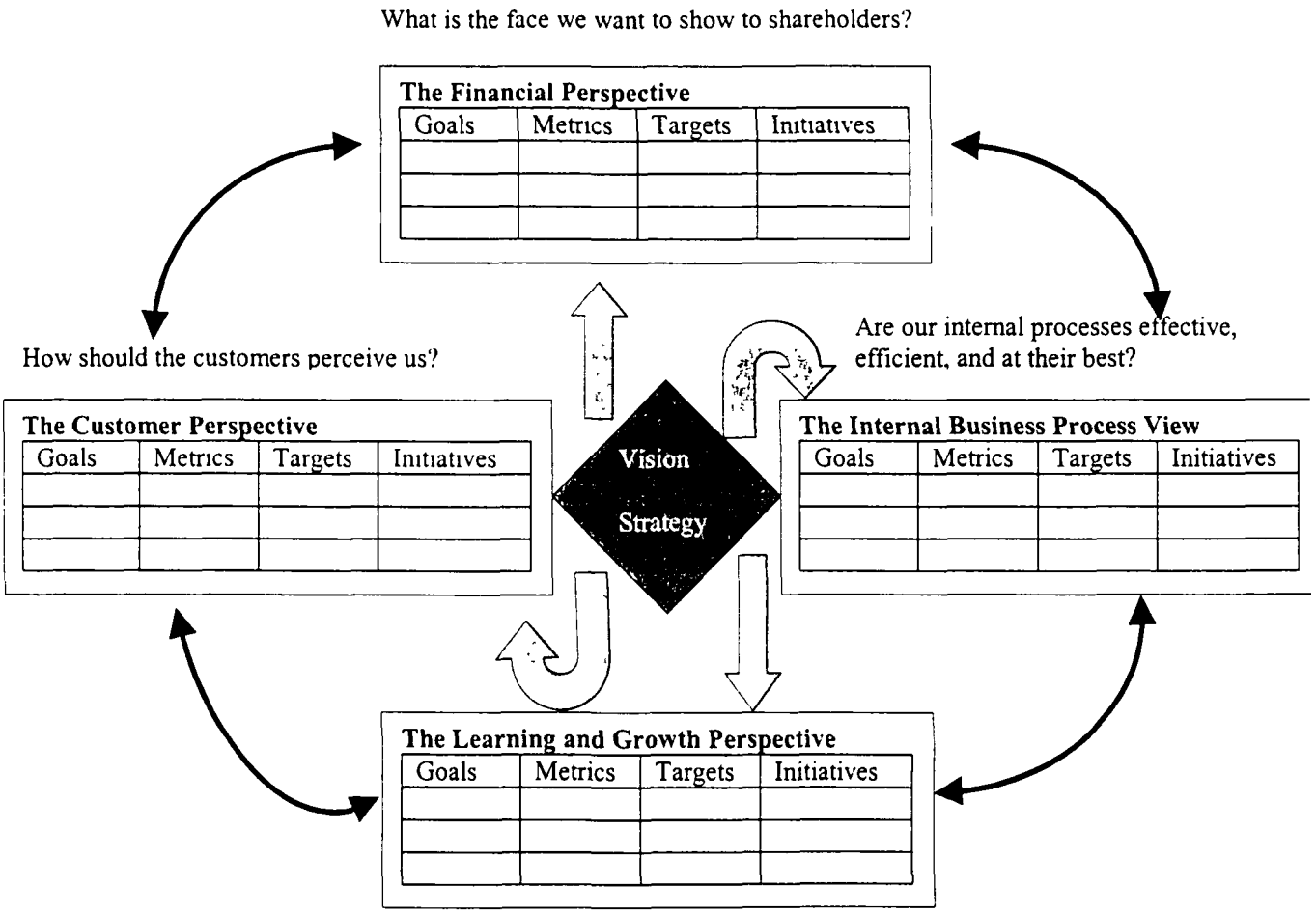


Figure 3.7: Balanced Score Card (BSC) Framework

The balanced score card (BSC) can also be used to evaluate the impact of KM system on four complementary criteria. The four processes involved in using the BSC approach for managing knowledge are described in Figure 3.8 below by Tiwana, showing the processes in the context of knowledge management.

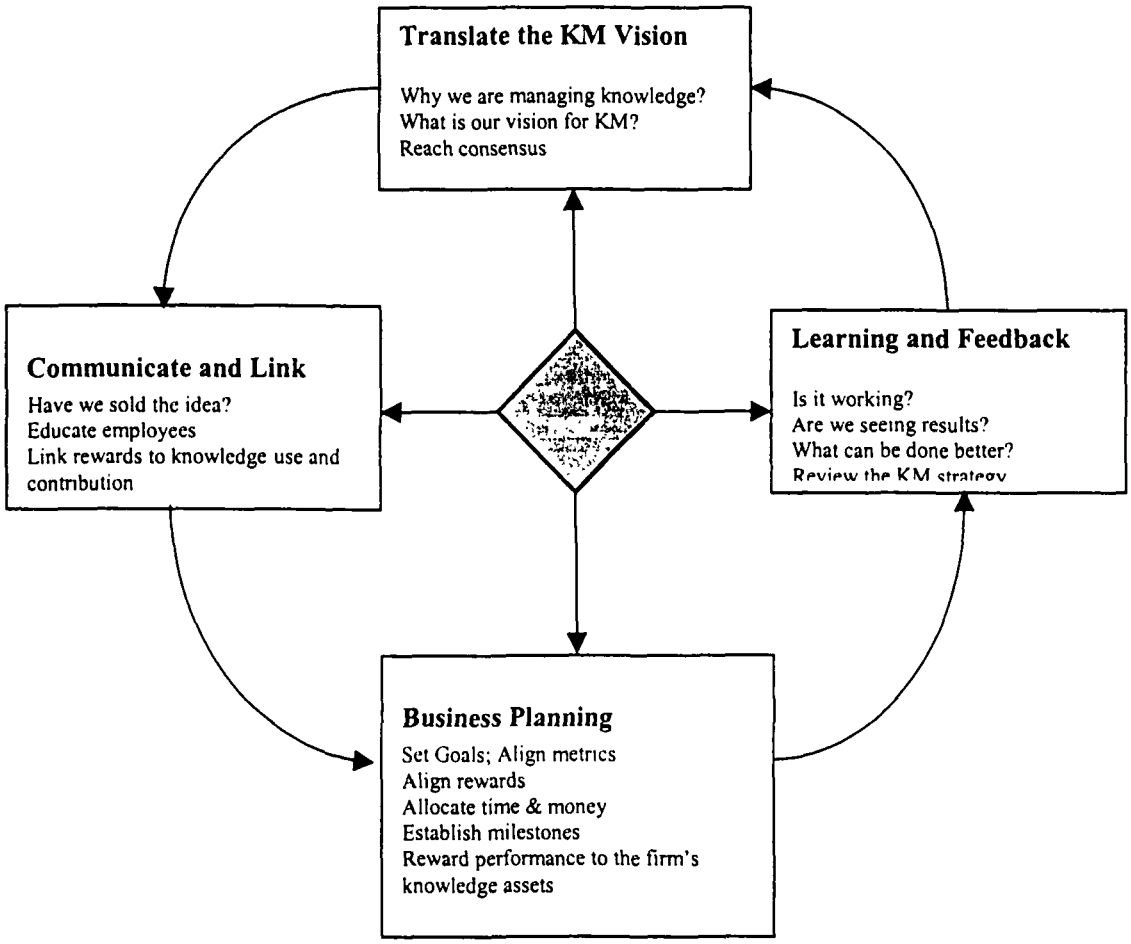


Figure 3.8: BSC Approach for Managing Knowledge

While illustrating the advantages of BSC, limitations have also been expressed. A well designed BSC model is very difficult to develop and it is rarely possible to adopt another firm's scorecard because subtle differences exist between even very similar firms. Neely (2002) has criticised BSC technique as covering inadequate dimensions and had proposed his stakeholder-based approach of performance measurement in his model "the performance prism" – as reviewed already.

An interesting "knowledge management performance framework" has been given by Gooijer (2001). He has presented two models for measuring KM performance and KM behaviours: a performance framework based on BSC approach, and a behaviour framework that identifies levels of practice demonstrated by individuals. While the KM performance scorecard maps the objectives for KM across BSC's key result areas, the KM behaviour framework identifies seven levels of KM skills for demonstrating collaborative behaviour. The seven levels of KM skills in adopting knowledge management in the organisation, as given by Gooijer, are of relevance, as given below.

0. Awareness but non-use of knowledge management tools or practices
1. Seeks information about knowledge management
2. Personal experimentation with knowledge management tools and practices
3. Personal implementation of knowledge management practices
4. Engaged with impact and consequences of knowledge management behaviour
5. Actively collaborates in all aspects of work
6. Refocussing knowledge management skills on new business opportunities

Finally, a publication titled 'closest' to the subject of the present dissertation has been reviewed. Moore (1999) has enumerated knowledge work metrics in his *"Knowledge Management Handbook"* in Chapter 6 titled "Performance Measures for Knowledge Management". He has however disappointed by restricting his application of knowledge work metrics to only software programme writing and thus treating the subject of KM measures at a rather micro-level software development firms only. For example, he has cited as knowledge work metrics, three key performance measures as productivity, delivery and defect density. Though for programme writing activity, he has explained in detail various measurement models like PNR, COCOMO, FPA, etc., obviously these measures cannot be generalised to any other knowledge-based activity other than programme writing and hence this literature though appearing to be promising by title, was not found to be of much relevance to the present research. However Moore has rightly identified two main areas for future research in

developing his approach to measuring knowledge work. The first area is improved metrics collection. This includes the definition itself of what metrics to collect and also the quantification of factors so identified.

The second area for further research identified by Moore is in defining formulae and/or quantification algorithms. As stated rightly by him, a great deal of statistical research is required to evolve a means of calculating accurate, meaningful values for each of the metrics so identified.

3.5 Implications of the Reviewed Literature for the Present Study

The first stream of literature examined helped in demystifying the buzz around KM and clarifying its basic concepts. The clear distinction between IT Management and KM brought out in the literature focusses on KM as the set of *business processes* - rather than on the tools and technologies of IT domain. The implementation methodology for KM and associated managerial challenges brought out in the literature has set the context for KM assessment and performance measurement as an ongoing activity. Finally, the review of literature on learning organisations – including the framework of "3 Ms" (Meaning, Managing and Measurement) - has been useful for bringing home the intrinsic characteristics of consulting firms (for ensuring survival and growth, consulting firms have to have the characteristics of learning organisations) and the importance of performance measurement and associated metrics.

Regarding the second stream of reviewed literature, it was observed that there is glaring inadequacy of published literature on KM applications in consulting companies – and more severely so for KM performance measurement in consulting firms. (The publications of trade associations and apex bodies like Consultancy Development Centre (CDC) and NASSCOM also were not of direct help in this specific stream of literature). Since the KM field itself is of recent origin, not much of research literature is available on KM applications. Within the innovative companies who have adopted KM as a systematic and formal business process, consulting

companies are of course, the leaders. But perhaps the initial apprehensions about the long term KM effectiveness and the competitive trade pressures, have been the strong inhibitors for these companies for making public their approaches and practices about KM. Nevertheless, the conceptual classification of KM strategies for consulting companies given by Hansen, et. al. and some other "guidelines" provided by other authors like Botkin and Dunford have a useful relevance to the present study. Other literature just reemphasises the seriousness and the need for more research in the area of KM performance evaluation.

Finally, the last portion of literature study provided the "state-of-the-art" on the subject of KM performance evaluation. An appreciation of the drawbacks of the existing traditional measures of IC/ KM has strengthened the need for more research into the subject. Outlining of some current research works has brought home the fact that despite some scattered, but appreciable efforts in that direction, as yet no effective framework of KM performance measures has been developed which can be used as a guide by the consulting organisations.

The literature reviewed in this section helped in showing the 'broad direction' for proceeding further. The benchmarking and balanced scorecard techniques have been useful at a conceptual level for providing an understanding of the need for an integrative mechanism for various possible disparate measures of KM. The stakeholder viewpoint for performance measures is another useful insight given by the literature. However, broadly speaking, other than getting an understanding of some useful KM concepts, identification of research gap in KM performance assessment, and picking up some constituent elements of performance measures suggested by some scholars for further examination, the present collection of available published literature has not been of substantive help for the present study. This rather inadequate 'state-of-the-art' on KM performance evaluation is understandable because the KM field itself is of recent origin and very few researchers have reached that level of depth to appreciate the importance of measures for KM effectiveness.

3.6 Summary

Three streams of KM literature – KM concepts, KM application in consulting organisations, and KM performance measurement – have been reviewed and the corresponding implications for the present study have been analysed. The literature on KM concepts clarified the prevalent notions and understanding (and *mis*understanding) about the subject field. Inadequacy of published work in second stream of literature proved to be a challenge for the present dissertation work, though some idea about initial KM applications in some leading consulting companies was definitely of help. Similar inadequacy of literature on KM performance evaluation comprising the third stream was also noticed. However, review of this stream of literature – comprising of some disparate and scattered research, but still appreciable for the focus and consistency - helped in showing the 'broad direction' for proceeding further.

In the next chapter, the research aims/ objectives and scope are given along with the research framework that guided this research. The research design and methodology used for various stages of field research and data analysis is presented in detail. The presentation format for the KM performance framework is also explained.

Chapter 4:

RESEARCH METHODOLOGY

Chapter 4: RESEARCH METHODOLOGY

" Have no fear of perfection, you'll never achieve it."
--Salvador Dali

4.1 Introduction

This chapter presents the research design and methodology used to address the research objectives and to validate the concept and structure of the "Framework of KM Performance Measures" evolved as an outcome of this research. After extensive survey of available literature and secondary information, the research began as exploratory, and in the course of exploratory investigations and fieldwork, a conceptual "Framework" was developed. The research then moved to prescriptive phase through statistical tests on the framework so evolved, followed by illustrative validation of the concept, structure and contents of the framework through some case studies. The recommendations of the research are based on the 'experience survey' and practical insights gathered through both the stages of research.

4.2 Research Boundaries and Objectives

The survey of existing literature as well as the secondary data on KM practices revealed that there are, as yet, no perfect metrics for knowledge work. Moreover, it is rarely possible to directly adopt a firm's performance metrics from one sector of economy (for example, petroleum refining) to another firm from a different sector (for example, IT consulting) because differences exist between various sectors of business operations and even between similar firms within a sector. In view of this inherent limitation of the KM field, this ***research was bounded in scope only to consulting firms*** – being *knowledge-focussed* in operation. Also, the investigations involving questionnaire design, interviews/experience-survey and case studies were confined to organisations ***based in India***, so that the above objectives of research could be successfully achieved - with concrete recommendations for application - within the time horizon of this research.

The research aimed at moving beyond the conventional static measures of performance into a dynamic broad-based approach of performance measurement focussed on

consulting firms. This involved broadening the context of KM performance measurement by investigating the significance of certain softer qualitative indicators along with hard quantitative financial measures - like ROI - used so far traditionally.

The objectives of the research included:

1. To examine the possible alternative measures of performance for consulting firms.
2. To propose certain new, innovative metrics for measuring quantitative *as well as qualitative* indicators including those from market/customer related, human/competency development, corporate leadership/strategy/KM practices and technology domains.
3. To evolve an integrated *framework* of KM based performance evaluation measures for such consulting firms, and
4. To validate the concept and structure of the evolved framework through illustrative case studies.

4.3 Research Design and Methodology

Since the KM field itself is of recent origin, not much of research literature was available on modelling for KM performance measures - particularly for consulting firms. As the starting stage of research process, three streams of KM literature – KM concepts, KM application in consulting organisations, and KM performance measurement – were reviewed. The literature on KM concepts clarified the prevalent concepts about the subject field. Inadequacy of published work in second stream of literature proved to be a challenge for the present dissertation work, though some idea about initial KM applications in some leading global consulting companies was of help. Similar inadequacy of literature on KM performance evaluation comprising the third stream was also noticed. However, review of this stream of literature – comprising of some disparate and scattered research, but still appreciable for the focus and consistency - helped in showing the 'broad direction' for proceeding further. The research framework - particularly the questionnaire/ interview schedule design and

conceptual validation of the framework through selective case studies - was broadly structured on the support of those earlier - though inadequate - research works.

After extensive survey of available literature and secondary information, the first stage of research began as exploratory, and in the course of exploratory investigations and fieldwork, a conceptual "Framework" was developed. In the second stage, the research moved to prescriptive phase through statistical tests of significance on the framework so evolved, followed by illustrative validation of the framework through some case studies. The two major stages of research process followed are:

Stage1: Development of the Conceptual Framework

1. Library research
2. Design of Questionnaire/ Interview Schedule for Primary Data Collection
3. Collection of Primary Data through Questionnaire/ Interview Schedule

Stage II: Statistical Testing and Illustrative Validation of Framework through Case Studies

1. Statistical testing
2. Illustrative Case Studies

Both the stages are described in detail as follows:

Stage I: Development of the Conceptual Framework

This stage of exploratory research comprised of the following steps:

1. ***Library Research***: gathering of secondary data and theoretical literature on published works through visiting leading specialised libraries like British Council Library, American Information Resource Centre, libraries of Tata Consultancy Services (TCS), Delhi Management Association (DMA), IIT Delhi, All India Management Association (AIMA), etc. The range of secondary data sources included annual reports and other documents from various companies, trade associations and major apex bodies like Consultancy Development Centre, New Delhi (CDC) , DMA, National Association of

Software and Service Companies (NASSCOM), AIMA, etc. The secondary data sources also included business publications like *Business Today, Business India, The Economic Times, Business Standard*, etc. and associated web sites of these organisations.

2. ***Design of Questionnaire/ Interview Schedule for Primary Data Collection***: This was one of the most enlightening stage of the research process, as it involved generation of ideas through intensive '*experience survey*' involving protracted discussions with some eminent professionals with rich knowledge on concepts and applications of KM in Indian scenario. As a starting reference, an initial draft of Questionnaire/ Interview Schedule was prepared on the basis of literature survey and secondary data. Then this draft questionnaire was put through rigorous scrutiny by six of these senior KM professionals - as a 'pre-test' field exercise - and discussed thoroughly about their detailed feedback on improvements required on contents and structure of the draft. This 'pre-test' exercise on the administration of draft primary data questionnaire/ interview schedule through extensive 'experience-survey' process helped in sharpening the focus of attention on KM determinant factors, and also in obtaining valuable inputs for the sampling frame for primary data collection. The 'experience survey' process was carried out involving following six senior experts:

   - A senior professor on IT/KM with over 35 years academic & industrial experience in top institutes of India (including IIT Kanpur) and abroad. He has guided several doctoral research students in IT and related fields.
   - Editor of a top management journal published in India, with rich survey experiences on performance of Indian business firms.
   - Principal Consultant of a global consulting organisation -with earlier experience in an India-based MNC in consumer goods.
   - Regional Chief of Information Services of one of Asia's leading consulting firms
   - Chief Technology Officer of a MNC in e-Learning area of business services.
   - A professional with doctoral research on ERP implementation in Indian scenario with extensive work experience in government sector and academics.

It is pertinent to mention here that for this exercise of intensive 'experience survey', it was not necessary to involve more than six experts. At this stage, it was not necessary to attempt a statistically valid sample: only an overall feel of 'workability' of the proposed questionnaire in the subsequent actual field administration was required.

After six rounds of detailed interactions with each of above professionals, the final questionnaire/ interview schedule was arrived at, which is given at Appendix A. Broadly, this stage involved structural and content-wise transformation of draft questionnaire into final, as given in Table 4.1:

Table 4.1: Questionnaire Design: Final vs. Draft

Draft Questionnaire had	**Final Questionnaire has**
4 sections comprising of Section 1: 10 Questions Section 2: Descriptive Section3: *74 factors over 17 categories seeking response on 10 -pt. scale* Section 4: Organisation profile	**2 sections** comprising of Section 1: 3 Questions(with 4 sub-questions for Q.1.) + Organisation Profile Section 2: *47 factors over 5 categories seeking response over 4 – pt. scale* + Respondent Profile

Two points concerning questionnaire design were particularly taken into consideration. The first relates to the choice of a 4-point rating scale for seeking respondent's perception about '*importance*' and *'ease of measurement'* for the listed 47 factors likely to be effective measures of KM performance (as against a more traditional 5-point Likert's scale). This was done particularly to avoid the 'central tendency' bias and to 'force' the respondent to rate his perception as either 2 or 3 when he does not want to give extreme ratings of 1 or 4. Walters (1996) has this to say on this:

"...there is evidence that if you offer respondents an odd number of options, they display an excessive tendency to plump for the middle one. This is particularly true if the options represent a scale of values. People do not like to commit themselves to 'extreme' values, so they tend to opt for the safe middle ground. To avoid possible bias, it is a good idea to offer an even number of options wherever possible."

The other point particularly deliberated was about the confidentiality of responses. Knowledge is the core asset of consulting firms for whom the process of knowledge management and its performance measurement can be the key competitive factors. In the words of Rajat Gupta, ex-Managing Director, McKinsey & Co.- quoted in Dunford (2000), *"Knowledge is the lifeblood of McKinsey"*. So the sensitivity of this issue - having a direct bearing to the topic of this research - made it necessary to offer (and assure ethically!) confidentiality option while obtaining the demographic profiles of themselves as well their companies. Walter's advice was followed again, as below:

".... In many cases, the primary concern of employees.....is confidentiality. What reassurance do they have that their views will not get straight back to management?

Clearly, you can provide no absolute proof that confidentiality will be maintained. Nevertheless, if you make a point of demonstrating that the questionnaires will be anonymous, that the analysis will be carried out away from the organisation.....,then you should dispel most people's fears....."

In view of above, the option of identification (individual and company) was left to the respondents. However despite this 'option', the assurance and confidence generated during personal meetings enabled 'majority' of respondents to 'open up' and to give names of their organisation, while giving their responses. However in some cases, the respondents were particular on this issue and they insisted on de-linking the organisational data (part I of Questionnaire) from the individual response (part II of Questionnaire). In the interest of this research (particularly to obtain data in part II, which forms the core data for developing the framework), their requests were honoured.

As Appendix A shows, apart from the multiple-choice and 4-point rating pattern of soliciting responses, the respondents were also allowed some space at regular stages to include their 'unstructured' comments. This non-statistical narrative data provided some insights about KM application and practices in some cases, which is discussed at the observation and discussion stage of this research in Chapter 5.

3. ***Collection of Primary Data through Questionnaire/ Interview Schedule:*** For administration of the questionnaire/ interview schedule, the target sample of about 100 'resource-persons' actively engaged or aware of KM activities, was to be taken. The secondary data had revealed that there are not many consulting firms in India who are actively engaged in KM programmes, and so a carefully controlled purposive/ judgement sampling approach was considered appropriate for this exploratory stage of research on convenience and feasibility considerations.

   The sampling frame for the chosen respondent population was arrived at from a supra-set of

   - Registered members of CDC
   - Registered members of NASSCOM
   - Institutional & Professional members of DMA
   - Dataquest panel of CIOs in India
   - Members of FMS Alumni Association

   As against the target sample of 100, the final sample size of valid sampling units turned out to be 108 (excluding 7 invalid/ incomplete responses) from the initial contacted set of about 300 persons judged as suitably representative from the above sampling frame. The target of the sampling unit was at the level of Director/ED/VP/GM/CIO/Functional or Group Head, etc. Most of the questionnaires were administered through personal field interviews - supplemented by follow-ups using telephonic and e-mail media, particularly for organisations outside Delhi.

The final sample of 108 respondents came out of 57 organisations representing a cross-section of

- Management consulting firms
- IT consulting/ Software services firms
- Engineering consulting firms
- Other specialised business consulting areas like HR consulting, Education consulting, Legal consulting, etc.

Appendix B gives the list of respondent organisations from which the sample was taken.

Representative Demographic Profile of Respondents

The representative demographic profile (*modal values*) of the sampled firms constituted a firm with an employee strength exceeding 3000, in business operation for over 10 years and already having (or getting into) a working KM programme (or similar activity) in operation.

The representative profile (*modal values*) of respondent KM resource persons included in the sample constituted a respondent having:

- Age group: 25-35 years
- Experience (Mean): 10.4 years (Maximum experience was 37+ years); Exclusive consulting experience: 7.8 years
- Education level: MBA/ Post-Graduate in Engineering.

Stage II: Statistical Testing and Illustrative Validation of Framework through Case Studies

The responses obtained were compiled and analysed (as described in detail in next section). The statistical analysis - based on significance testing between means - led to prioritised ranking of all 47 KM Performance Measures investigated in Stage I, in descending order of importance with associated ease of measurement for each Measure. The guidelines prescribed in earlier research (Skyrme, 2001) recommended having

"*enough, but not too many, indicators in each category (typically two to four, giving around 12-15 key indicators in total)*" for improving the effectiveness of the KM programme on practical considerations. So for the purpose of illustrative validation of the concept and contents of the KM performance Measurement framework, the top 15 important factors listed in Table 4.2 below, were included for the next step of selective case studies:

Table 4.2: Top 15 Important Factors with Associated Categories

Importance Rank No.	Factor	Category
1	Customer satisfaction	Market/ Customer related
2	CEO's personality/ leadership style	Corporate leadership/ strategy/ practices
3	Return on Investment ROI	Financial
4	Employee satisfaction	Human/ competency development
5	Availability of a knowledge sharing/ dissemination mechanism	Corporate leadership/ strategy/ practices
6	Availability of company's stated 'Vision'	Corporate leadership/ strategy/ practices
7	Availability of a Quality Management systems/practices documentation	Corporate leadership/ strategy/ practices
8	Image	Market/ Customer related
9	Reuse rate of existing knowledge/ best practices	Corporate leadership/ strategy/ practices
10	KM integration with strategy	Corporate leadership/ strategy/ practices
11	Annual revenue growth	Market/ Customer related
12	New orders	Market/ Customer related
13	Availability of company wide collaborative/messaging/workflow tools	Corporate leadership/ strategy/ practices
14	Annual IT investments/Revenue	Technological
15	Ratio of repeat customers to total	Market/ Customer related

The set of top 15 factors formed the baseline for the intended framework of KM performance measures and hence was used for illustrative validation of the same through case studies. {The structure of the recommended framework - comprising of a pictorial representation in 'radar chart' or 'bar chart' format, as well as a functional index 'KMPI' ("*Knowledge Management Performance Index*") is explained in detail subsequently.}

Table 4.3 lists the 4 firms taken up for case studies with indicative levels of key resource persons.

Table 4.3: Firms Included for Illustrative Case Studies

Company	**Indicative Levels of Key Resource Person(s)**
Tata Consultancy Services	Consulting Advisor, Head of Business Development (for an 'Industry Practice')
Engineers India Ltd.	Executive Director (Corporate Planning), Assistant General Manager (IT)
Kale Consultants Ltd.	Manager, Business Development
RITES Ltd.	General Manager

In-depth discussions were held with above key resource persons for each firm using a guided discussion format to ensure uniformity of approach for all case studies. Appendix C shows the 'Discussion Format' used for case studies. Through these personal interactions at case study stage, a deeper perception and clearer insight of KM practices and performance measurement in Indian companies was obtained. This process of illustrative validation through case study interactions, helped in marginal refinement of the framework (*curtailing from 15 factors in 5 categories to 12 factors in 4 categories*) content-wise. However, the structure and presentation format was found to be acceptable by all firms and was retained. The recommended framework is discussed in Chapter 5 for illustration of the computational process for the case studies.

{It is pertinent to mention here that initially the concept validation of the framework was intended to be done with only 2 consulting firms. However the encouraging personal rapport developed with some key respondents at the first stage of field research made it possible to undertake studies of as many as 4 consulting firms based in India. Though comparative observations on relevant aspects are given in next chapter for all 4 firms, detailed background information is given in separately in Appendix D for 2 firms - one following purely *codification* strategy for KM and the other also following *personalisation* approach. Additional secondary information (trade publications, web resources, company literature, etc.) was referred for these two firms.}

4.4 Data Analysis Methods

The primary data was originally collected from 115 respondents. However on scrutiny and editing of data (at the field level, on the spot editing and modifications were done wherever possible) 7 responses were found invalid/ incomplete. An example of invalid response is when the respondent has answered to sub-questions of Question 1 in part I of questionnaire, even when he answered "No" to main Question 1. When a full block of data in part II was missing, the response was not considered complete for further processing and hence was discarded. Of course if the respondent didn't answer to one or just a few out of 47 ratings solicited the response was processed further and statistical analysis took care of such missing data. So after excluding 7 invalid/ incomplete responses, still 108 responses remained which in itself exceeded the target sample of 100.

These 108 responses belonging to 57 firms came out of stage I of field research. *The 'core data' collected for further analysis and developing the framework of KM performance measures was the 'perception' of 108 respondents about 'Importance' and 'Ease of Measurement' on a 4-point scale - for each of the 47 suggested factors in the questionnaire.* In addition, for each of the 57 respondent organisations, information was sought on the status of KM practice, mainly in multiple choice format (3 questions of Part I of the questionnaire). This information as well as the demographic profile data of the respondents and their organisations was used for only for effective classification, analysis and presentation of the *core data.*

For developing the conceptual framework of KM performance measures - the key analysis of data (collected through part I and part II of questionnaire), comprised of the following steps:

a) Arriving at the *prioritised ranking* of all 47 KM Performance Measures *in descending order of importance* so that "top 12" statistically significant measures can be taken up for Stage II of investigations (case studies). The 47 factors put through statistical analysis are listed in Table 4.4:

Table 4.4: List of 47 Factors Investigated Through Statistical Analysis

1 Return on Investment ROI (%)
2 Employee Value Added EVA (Rs.)
3 Tobin's Q (Ratio of market value of firm over cost of replacing physical assets)
4 Market share (%)
5 Annual revenue growth (%)
6 New orders (No.)
7 Av. orders per customer (No.)
8 Ratio of repeat customers to total (Ratio)
9 Customer satisfaction
10 Av. expenses per unsuccessful bid (Rs.)
11 Success ratio for new bids (Ratio)
12 Image
13 Av. age of employees (Years)
14 Av. experience of employees (Years)
15 New ideas of employees implemented (No.)
16 Av. training imparted per year (Days)
17 Training on KM practices (Days)
18 Training/ competence development spending : Av. per employee (Rs.)
19 Library investment per employee (Rs.)
20 Seminars organised by company (No.)
21 Total papers published per year (No.)
22 Total no. of invited talks per year (No.)
23 Patents held & pending (No.)
24 Average age of patents held (Years)
25 Av. amount of rework/rejects (%)
26 Employee satisfaction
27 Industry accreditation
28 Certifications by industry/standards bodies
29 Availability of company's stated 'Vision'
30 CEO's personality/ leadership style
31 No. of executive levels in hierarchy
32 No. of direct reports to CEO
33 KM integration with strategy
34 Duration of KM functioning (Years)
35 Staff dedicated for KM function (No)

36 Availability of an employee experience recording mechanism
37 Availability of a competency mapping mechanism
38 Availability of a Quality Management systems/practices documentation
39 Availability of a knowledge sharing/ dissemination mechanism
40 Reuse rate of existing knowledge/ best practices (%)
41 Time spent on project closing reports
42 Time saved in creating new proposals
43 IT investments (Rs.)
44 Communications investments (Rs.)
45 R&D investments /revenue (Ratio)
46 Duration of Web-based functioning (Years)
47 Availability of company wide collaborative/messaging/workflow tools

Viewing the total responses as a 'set of 47 samples' (of maximum sample size = 108), arithmetic mean was calculated first for each of the 47 'samples' and then sorted in descending order. The highest value of mean so calculated was 3.60 for the factor 'Customer Satisfaction'. The treatment given to the data set was analogous to *testing the difference between two sample means for large sample size* (n > 30). With reference to the highest value of sample mean (= 3.60, for customer satisfaction) the test statistic 'z' (standard normal variable) was computed using the formula given below, for each of the 46 possible pairs of comparison:

$$z = \frac{|\bar{x}_1 - \bar{x}_2|}{\sqrt{\{(s_1^2/n_1) + (s_2^2/n_2)\}}} \sim N(0,1)$$

where

s_1, s_2 = Std. deviation for the two samples

n_1, n_2 = Sample size for the two samples

The factor list was then sorted in ascending order of 'z' values so computed. This gave the factors listed strictly in decreasing order of importance - starting from the customer satisfaction as the most important factor determining KM effectiveness. The ranking of factors so listed was statistically sound because the treatment of comparing and ranking various factors on test statistic 'z' took care of standard error of the difference between the means and also the

variability in 'sample sizes' because of certain 'missing responses' for some of the factors.

The top 12 factors from the list so derived were then taken as the topmost 12 'statistically significant' factors determining KM performance. This list (given in Table 4.2 earlier) formed the inputs for stage II investigations through case studies.

b) Arriving at the 'most typical opinion' about the *ease of measurement* for each of the above 47 factors on a scale of 1 to 4.

The responses obtained at stage I of survey included the perceptions about the ease (or difficulty) in accurate measurement/ quantification of the entire 47 factors on a 4-point scale. The most typical value of this variable is best determined as the *mode*, as it is given most often (with maximum frequency of occurrences) by the respondents for a particular factor. The main advantage of choosing mode for this analysis is that it is not influenced by the extreme values; so it is the appropriate measure of central tendency for this response.

c) From the main data set of 108 responses, forming smaller homogeneous sub-sets of data as follows:

1. All responses from companies who already have (or being put in place) KM programme or similar activity in their organisations.
2. All responses from the companies who don't have a KM programme (or it is unknown)
3. From the data subset at 1 above, another subset of responses from those companies who also have a 'system for ongoing review of KM effectiveness' in their companies

4. A residual data set (inverse of 3. above) of responses from companies who have a KM programme but don't yet have a system for ongoing review of effectiveness
5. All responses from IT consulting sector
6. All responses from companies operating in other sectors like engineering consulting, management consulting, etc.
7. All responses from Indian companies
8. All responses from MNCs

d) For the above 8 sub-sets of data, carrying out statistical analysis similar to a) above for arriving at the 'top 12' statistically significant factors in the descending order of 'z' values. However wherever the data subsets are smaller than 30, then treatment given to the data set was analogous to *testing the difference between two sample means for small sample size* ($n \leq 30$). Hence, for such comparisons, instead of 'z', the test statistic 't' is computed for each of the compared pairs of samples. For example, for determining the ranked list of important factors for data subsets mentioned at 4 or 8 above, the explicit number of respondents are just 15 or 12 respectively. Hence instead of 'z' statistic, 't' value is more appropriate in such cases of small samples. The formula for 't' value is as follows:

$$t = \frac{|\bar{x}_1 - \bar{x}_2|}{\sqrt{\{(n_1 s_1^2 + n_2 s_2^2)/n_1 n_2\}}}$$

where

S_1, S_2 = Std. deviation for the two samples

n_1, n_2 = Sample size for the two samples

d.f. for 't' = $(n_1 + n_2 - 2)$

The ranked lists in decreasing order of importance were derived for each of the data subsets. The top most 12 'statistically significant' factors determining KM performance were then used for next step.

e) Comparing the outcome of d) above for each pairs of sub data sets - 1 with 2, 3 with 4, 5 with 6 and 7 with 8 for further interpretation and discussions (given in next chapter).

f) Comparing the outcomes of d) and e) above with the outcome of a) for further interpretation and discussions (given in next chapter)

4.5 Data Presentation Format for the Recommended Framework

The structure of the recommended framework comprises of a functional index 'KMPI' ("*Knowledge Management Performance Index*") as well as a pictorial presentation in 'Radar Chart' format. However for pictorial presentation, apart from the 'Radar Chart' format, an alternative 'Bar Chart' format can also be deployed -- depending on the individual preference or visual appeal of the concerned user. The same is explained here.

a) Functional Relationship Presentation

The framework proposed by this research recommends computation of a relative value of a 'functional index' titled *Knowledge Management Performance Index* (KMPI). This is arrived at by a functional relationship

$$\mathbf{KMPI = KMP \times KMI}^{[1]}$$

where

KMPI is Knowledge Management Performance Index. It is an ***aggregate relative measure*** of KM 'performance' of the company with respect to the 'benchmark' preferred by the company for monitoring its own performance, *as well as* the relative KM 'intensity' of the company. For determining relative KM 'intensity', the company can either have as the reference base - its own area of consulting operations, or the consulting domain as a whole.

[1] A more rigorous mathematical treatment for evolving the functional relationship KMPI=f(KMP,KMI) is not required and beyond the scope of the present research. This is because the recommended framework computes the "relative values" of KMPI for any firm with reference to the chosen benchmark, as relativity of

KMP is relative value of ***KM performance*** with respect to the chosen benchmark. For the illustrative case studies given, top 12 important factors (instead of 15 factors originally thought at Stage I of research) were considered for performance monitoring with reference to the benchmark value. For illustrative validation, the benchmark chosen is the *'company's own performance in the preceding year'*. This is because all the 4 firms studied at stage II mentioned this as one of the common benchmarks, along with other preferred benchmarks (competitors, industry average, etc.). The product of 'change ratios' (i.e., 1.00 signifies no change; 1.05 signifies 5% improvement over benchmark; 0.95 signifies 5% deterioration of that factor against benchmark) of each of the top 12 important factors gives KMP for a company.

KMI denotes the relative ***KM intensity*** of the company with respect to either the industry average for the company's area of operations or with respect to the averages across all industry/ sectors in consulting services domain. This is an indication of how important KM activity is for the company's business - with reference to the aggregate industry/ sector or the consulting business as a whole. *Higher the value, more is the need for putting an effective measure of KM performance.* However lower value of KMI does not indicate poor performance of the company; it just indicates that KM monitoring need not be critical for this company at this stage. For the illustrative purpose of the framework, KMI is computed with respect to the averages across all industry/ sectors in consulting services domain. However interactions during case studies also suggest choosing the industry/ sector aggregates as the base for comparisons. The value of KMI is relative to 1 (KMI = 0.25 suggests rather lower knowledge intensive company; value 4.5 indicates a highly intensive company requiring close KM performance monitoring.)

b) Pictorial presentation

KMPI is important for monitoring the "top 12" KM performance measures - rather than any mathematically abstract absolute values.

The other presentation format is a pictorial diagram either in the "*radar chart*" format or "*bar chart*" format. Figure 4.1 below illustrates the KMI chart in radar format for the top 12 important KM measures of a firm included in case study.

As an alternative pictorial presentation, the same information can be displayed in a bar chart format, as given in Figure 4.2 below:

Figure 4.1: Example of KMI Chart (Radar Chart)

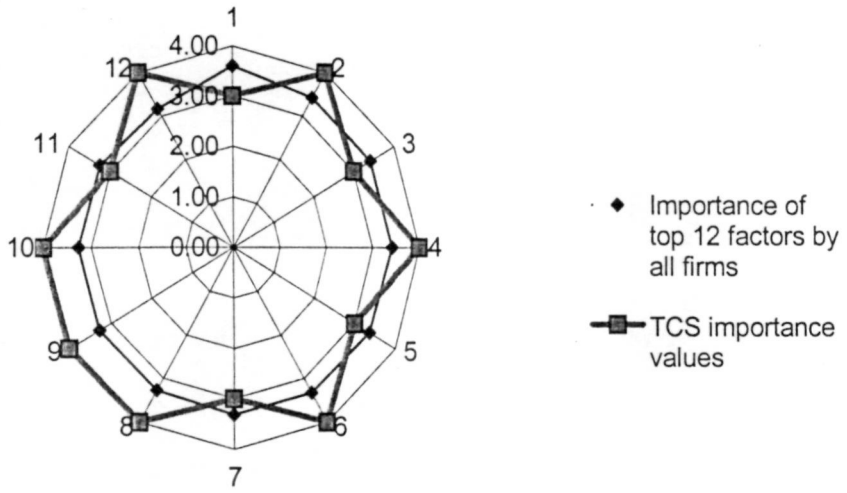
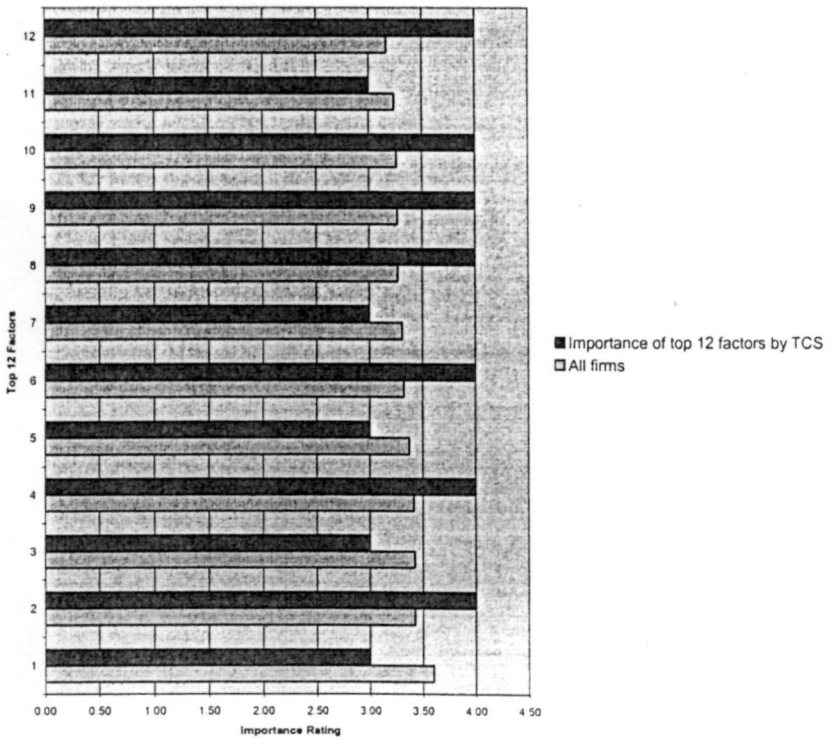
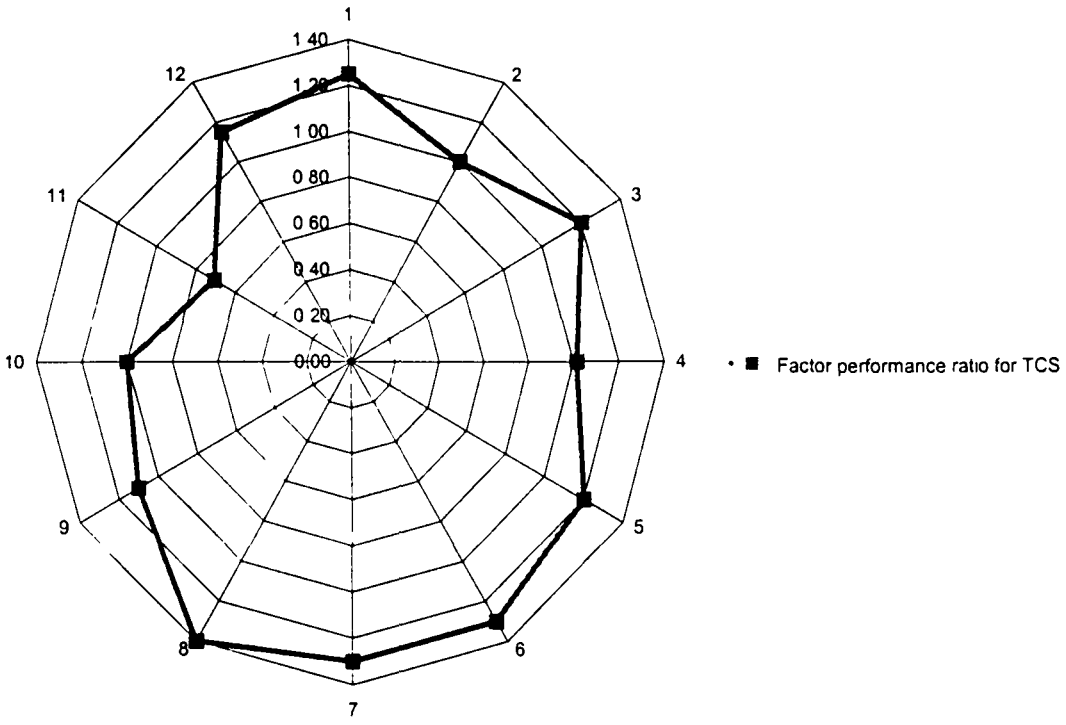


Figure 4.2: Example of KMI Chart (Bar Chart)



Like KMI, the presentation of KMP is also done for the company in the 'radar chart' format as well as the 'bar chart' format, as shown in Figures 4.3 and 4.4 below. These charts pictorially depict the performance of the company *over previous year* (as the benchmarking target) on the 'top 12' KM performance measures recommended by this research.

Figure 4.3: Example of KMP Chart (Radar Chart)

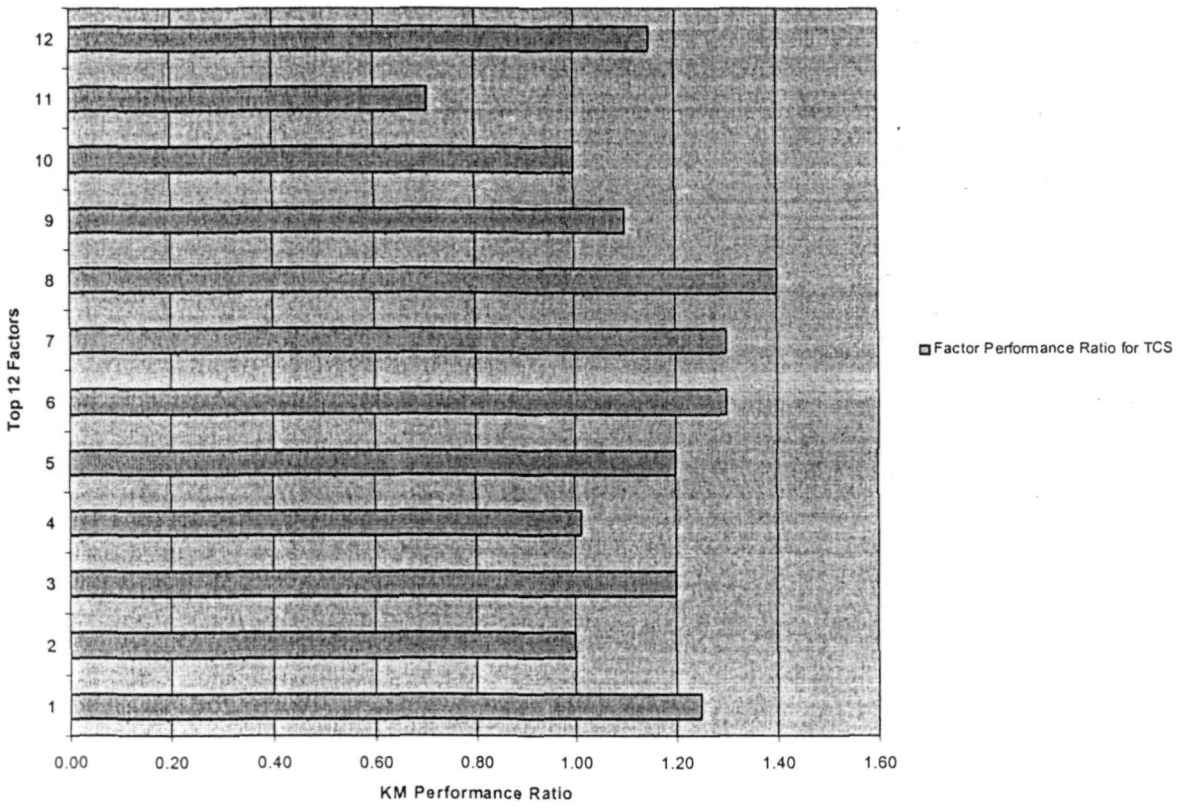


Chapter 5 discusses in detail the recommended framework using illustrations from case studies. Recommendations for implementation of the framework are given in the concluding chapter.

4.6 Summary

This chapter presented the research aims/ objectives, research design and methodology including the methods of data collection, analysis and presentation leading to a reference base for detailed analysis and interpretation of the research outcomes. After the detailed literature survey in three distinct streams and the study of secondary data, the research

Figure 4.4: Example of KMP Chart (Bar Chart)



started as exploratory through 'experience survey' approach. After collection of primary data in a semi-structured questionnaire/ interview schedule, a conceptual framework of KM performance measures was evolved. This was then put through the statistical tests and validated through case study interactions. The insights gathered through the illustrative case study validation stage were incorporated into the finally recommended framework after detailed analysis and interpretation. The presentation format for the framework is also explained in this chapter.

The following chapter presents the observations and analysis of the research outcome with associated implications for adoption of the proposed framework for KM performance measurement. The recommended framework is also discussed with the help of illustrative case studies for conceptual validation of the same.

Chapter 5:

DATA ANALYSIS AND INTERPRETATION

Chapter 5: DATA ANALYSIS AND INTERPRETATION

"Do not guess when you can calculate, Do not calculate, when you can measure."
--Archimedes

5.1 Introduction

Data analysis methods used for statistical testing of the primary data collected at stage I of the research were described in the previous chapter on Research Methodology. 108 responses belonging to 57 consulting firms came out of stage I of field research. The 'core data' collected for analysis and developing the framework of KM performance measures was the 'perception' of 108 respondents about *'Importance'* and *'Ease of Measurement'* on a 4-point scale - for each of the 47 factors listed in the questionnaire. In addition, for each of the 57 respondent organisations, information was sought on the status of KM practice and review mechanisms. This information as well as the demographic profile data of the organisations was used for effective classification, analysis and presentation of the *core data* given by 108 respondents.

This chapter gives the outcome of primary data analysis by way of coming out with a *ranked list* of important measures of KM performance, which formed the premise for the recommended "Framework of KM Performance Measures". The chapter then describes a comparison of 4 firms as 'case studies' for illustrative validation of the concept, structure and contents of the proposed framework. Detailed background information about two case firms studied in-depth is given in Appendix D.

5.2 Ranked List of Important KM Performance Measures

All 108 responses from 57 organizations pertaining to 47 KM Performance Measures (also mentioned interchangeably in this dissertation as 'Factors') investigated at stage I of field research were analysed statistically to arrive at the prioritised ranking, in descending order of importance. For each of these 47 Measures, the most typical opinion (modal value) about the ease of accurate measurement/ assessment was arrived at – on a scale of 1 to 4. Table 5.1 gives ranked list of all 47 factors with associated ratings on ease of measurement/ assessment.

Table 5.1: Ranked List of All Measures (For Whole Sample)

Factor	Ease of measurement	Importance Rank
• Customer satisfaction	2	1
• CEO's personality/ leadership style	3	2
• Return on Investment ROI (%)	4	3
• Employee satisfaction	2	4
• Availability of a knowledge sharing/ dissemination mechanism	2	5
• Availability of company's stated 'Vision'	3	6
• Availability of a Quality Management systems/practices documentation	3	7
• Image	2	8
• Reuse rate of existing knowledge/ best practices (%)	2	9
• KM integration with strategy	2	10
• Annual revenue growth (%)	4	11
• New orders (No.)	4	12
• Availability of company wide collaborative/messaging/workflow tools	3	13
• IT investments (Rs.)	4	14
• Ratio of repeat customers to total (Ratio)	4	15
• R&D investments /revenue (Ratio)	3	16
• Availability of a competency mapping mechanism	2	17
• Market share (%)	4	18
• Availability of an employee experience recording mechanism	3	19
• New ideas of employees implemented (No.)	2	20
• Employee Value Added EVA (Rs.)	2	21
• Communications investments (Rs.)	4	22
• Certifications by industry/standards bodies	4	23
• Success ratio for new bids (Ratio)	3	24
• Training on KM practices (Days)	4	25
• Time saved in creating new proposals	2	26
• Av. amount of rework/rejects (%)	2	27
• Industry accreditation	3	28
• Av. training imparted per year (Days)	4	29
• Av. experience of employees (Years)	4	30
• Training/ competence development spending : Av. per employee (Rs.)	4	31
• Duration of KM functioning (Years)	3	32
• Staff dedicated for KM function (No.)	4	33
• Av. orders per customer (No.)	4	34
• Time spent on project closing reports	3	35
• No. of executive levels in hierarchy	4	36
• Patents held & pending (No.)	4	37
• Duration of Web-based functioning (Years)	4	38
• Av. expenses per unsuccessful bid (Rs.)	2	39
• No. of direct reports to CEO	4	40

• Total papers published per year (No.)	4	41
• Library investment per employee (Rs.)	4	42
• Total no. of invited talks per year (No.)	4	43
• Seminars organised by company (No.)	4	44
• Av. age of employees (Years)	4	45
• Tobin's Q (Ratio of market value of firm over cost of replacing physical assets)	2	46
• Average age of patents held (Years)	4	47

During pre-case study rounds of discussions on the above ranked list of Measures, it was established that out of above list only "top 12" measures should be included in the Framework of KM performance measures on practical considerations of performance monitoring and implementation. This is also supported by the guidelines prescribed in earlier empirical research on the subject (Skyrme, 2001). Thus, the top 12 important measures with associated broad *category* of each measure (taken from the Questionnaire at Appendix A) – as given below in Table 5.2 - constituted the Framework of KM measures for evaluation of relative KMI, KMP and KMPI values for illustrative case studies.

Table 5.2: Top 12 Measures with Associated Categories (Whole Sample)

Importance Rank	Factor	Category
1	Customer satisfaction	Market/ Customer related
2	CEO's personality/ leadership style	Corporate leadership/ strategy/ practices
3	Return on Investment ROI	Financial
4	Employee satisfaction	Human/ competency development
5	Availability of a knowledge sharing/ dissemination mechanism	Corporate leadership/ strategy/ practices
6	Availability of company's stated 'Vision'	Corporate leadership/ strategy/ practices
7	Availability of a Quality Management systems/practices documentation	Corporate leadership/ strategy/ practices
8	Image	Market/ Customer related

9	Reuse rate of existing knowledge/ best practices	Corporate leadership/ strategy/ practices
10	KM integration with strategy	Corporate leadership/ strategy/ practices
11	Annual revenue growth	Market/ Customer related
12	New orders	Market/ Customer related

Two observations are pertinent here. The first is that this list of top 12 measures is for the consulting domain as a whole – covering across all major sectors of operations including IT consulting, management consulting, engineering and infrastructure projects consulting, education consulting, telecom consulting, legal consulting, HR consulting, etc. The second and more noteworthy point is that out of top 12, just one measure is financial and the remaining 11 are from 3 *non-financial* categories (Market/customer related: 4 measures; Corporate: 6 measures; Human/ competency development: 1 measure). Even the sole financial measure ROI is ranked at third position – preceded by customer satisfaction as the top measure of KM performance followed by CEO's personality/ leadership style as the second important factor.

Incidentally, none of the top 12 measures is from the 'technological' category, and this is quite a reinforcing viewpoint that *KM is not primarily technology; it is more a business and corporate issue.* The first technological measure is ranked at number 15; it relates to IT investments relative to the revenue of the firm.

Another point to be observed is about the ease of accurate measurement/ assessment of each of these top 12 measures. Perusal of Table 5.1 will indicate that only following 3 factors from top 12 are directly measurable (corresponding to ease of measurement rating = 4 as borne out of the survey of 108 respondents):

Importance Rank	Measure
3	Return on Investment ROI
11	Annual revenue growth
12	New orders

This implies that as many as 9 measures from top 12 are not so easy to assess or measure accurately. This observation has significant implications for the corporate management. Establishment of suitable measurement/ assessment mechanisms for important KM measures like Customer Satisfaction, Employee Satisfaction, CEO's Leadership, etc. becomes the pre-requisite before putting in place a KM performance measurement system.

5.3: Analysis/ Observations on KM Measures for Various Data Sub-sets

The ranked list of KM measures analysed in paragraph 5.2 above pertained to full data set of 108 responses across all sectors of consulting business and covering firms in private sector and public sector, including firms with MNC parents. The sampled data set of 108 firms already having a KM system (with, or without a KM performance review mechanism), as well as firms not having a formal KM system in place. Thus while the full sample represented comprehensively the consulting firms domain as a whole, a need was felt to investigate any differences in KM measures between various sub-sets of whole data. This was done by forming smaller homogeneous sub-sets of data from the whole sample after excluding respondents who insisted on anonymity and de-linking of organisational data from the 'core data' on factor importance ratings. The data subsets so formed were then subjected to similar statistical significance analysis for arriving at 'top 12' measures in each case. These are given in Table 5.3 below:

Table 5.3: Data Sub-sets Analysed

Data Sub-set criteria	No. of identified firms	No. of identified respondents	'Test-statistic' for significance testing (importance ranking)

KM system existing or not 1. All responses from companies who already have (or being put in place) an existing KM programme 2. All responses from the companies who don't have a KM programme (or it is unknown)	37 11	54 20	'z' (standard normal variable) 't' {student 't' with d.o.f. =(n1+n2)- 2}
KM review mechanism existing or not 3. From the data subset at 1 above, another subset of responses from those companies who also have a 'system for ongoing review of KM effectiveness' in their companies 4. A residual data set (inverse of 3. above) of responses from companies who have a KM programme but don't yet have a system for ongoing review of effectiveness	22 15	39 15	'z' 't'
Area (IT consulting or other sectors) 5. All responses from IT consulting sector 6. All responses from companies operating in other sectors like engg. consulting, management consulting, legal consulting, HR consulting etc.	29 19	49 25	'z' 't'

Indian vs. MNC firms			
7. All responses from Indian companies	22	47	'z'
8. All responses from MNCs	12	12	't'

The outcome of comparative analysis for each pair of data sub-sets is given below. The 'z' and 't' values (computed as well as reference value for the respective degrees of freedom) are also given -- as an illustration of arriving at the 'ranked order' of KM measures for the last pair of data sub-set. (*The descending order of importance ranks corresponds to the ascending order of the computed 'z' or 't' values.*)

KM System Existing or Not:

The top 12 important measures for the firms already having a KM system in place are given below:

1 Customer satisfaction
2 Return on Investment ROI (%)
3 Availability of a knowledge sharing/ dissemination mechanism
4 Reuse rate of existing knowledge/ best practices (%)
5 Availability of company wide collaborative/messaging/workflow tools
6 Availability of a Quality Management systems/practices documentation
7 CEO's personality/ leadership style
8 Employee satisfaction
9 R&D investments
10 Availability of company's stated 'Vision'
11 KM integration with strategy
12 Availability of a competency mapping mechanism

The corresponding top 12 measures for those firms not having a KM system are as follows:

1 CEO's personality/ leadership style
2 Availability of a Quality Management systems/practices documentation
3 Customer satisfaction
4 Availability of company's stated 'Vision'
5 Employee satisfaction
6 Return on Investment ROI (%)

7 Availability of a knowledge sharing/ dissemination mechanism
8 KM integration with strategy
9 Image
10 Availability of company wide collaborative/messaging/workflow tools
11 Certifications by industry/standards bodies
12 Annual revenue growth (%)

On comparison, it comes out that regardless of existence of a formal KM system in the firm, the following measures show up as '**common**' in the top 12 list of important KM performance measures:

- Customer satisfaction
- Return on Investment ROI (%)
- Availability of a knowledge sharing/ dissemination mechanism
- Availability of company wide collaborative/messaging/workflow tools
- Availability of a Quality Management systems/practices documentation
- CEO's personality/ leadership style
- Employee satisfaction
- Availability of company's stated 'Vision'
- KM integration with strategy

The following three measures distinguish the importance perception for the firms already having the experience of KM system:

- Reuse rate of existing knowledge/ best practices (%)
- R&D investments
- Availability of a competency mapping mechanism

In place of above 3 factors, the firms not having experienced a formal KM system perceive importance to the following 3 factors:

- Image
- Certifications by industry/standards bodies
- Annual revenue growth (%)

KM Review Mechanism Existing or Not

The top 12 important measures for the firms already having a KM system in place as well as a system for on-going review of KM effectiveness are given below.

1 Customer satisfaction
2 Return on Investment ROI (%)
3 Availability of a knowledge sharing/ dissemination mechanism
4 Employee satisfaction
5 Reuse rate of existing knowledge/ best practices (%)
6 R&D investments
7 CEO's personality/ leadership style
8 KM integration with strategy
9 Availability of a Quality Management systems/practices documentation
10 New ideas of employees implemented (No.)
11 Availability of company's stated 'Vision'
12 Availability of company wide collaborative/messaging/workflow tools

As against 39 responses from firms having a KM review system working, only 15 responses could be identified from the firms not having a system for review of KM effectiveness. The limitation of small sample analysis does creep in here. Notwithstanding this, with an intention to identify significant measures common to both data sets, the corresponding top 12 measures for these firms were arrived at as follows:

1 Customer satisfaction
2 Availability of company wide collaborative/messaging/workflow tools
3 Availability of a knowledge sharing/ dissemination mechanism
4 Annual revenue growth (%)
5 New orders (No.)
6 Return on Investment ROI (%)
7 Availability of a competency mapping mechanism
8 Availability of a Quality Management systems/practices documentation
9 Availability of an employee experience recording mechanism
10 Image
11 Market share (%)
12 IT investments (Rs.)

On comparison, it comes out that regardless of existence of a formal review mechanism for KM system in the firm, the following measures show up as '**common**' in the firms having some KM system operation, among the top 12 list of important KM performance measures:

- Customer satisfaction
- Return on Investment ROI (%)
- Availability of a knowledge sharing/ dissemination mechanism
- Availability of a Quality Management systems/practices documentation

- Availability of company wide collaborative/messaging/workflow tools

In addition to above, the following measures are accorded distinct importance among the top 12 ranks by the firms already having the experience of a review mechanism for KM system over those not having a review mechanism:

- Employee satisfaction
- Reuse rate of existing knowledge/ best practices (%)
- R&D investments
- CEO's personality/ leadership style
- KM integration with strategy
- New ideas of employees implemented (No.)
- Availability of company's stated 'Vision'

Area of Operation (IT Consulting or Other Sectors)

A sectoral analysis of responses is compared here. Since IT consulting firms constituted the largest segment of responses (49 responses out of 108), this sector can be taken as a homogeneous data sub-set for comparison with overall consulting domain or with all other firms in areas other than IT consulting. The top 12 important measures for IT consulting area are:

1 Customer satisfaction
2 Return on Investment ROI (%)
3 Employee satisfaction
4 Availability of a knowledge sharing/ dissemination mechanism
5 Reuse rate of existing knowledge/ best practices (%)
6 Availability of company's stated 'Vision'
7 New orders (No.)
8 CEO's personality/ leadership style
9 KM integration with strategy
10 Annual revenue growth (%)
11 Availability of a Quality Management systems/practices documentation
12 Image

Comparing above with the top 12 list of measures given in table for the consulting domain as a whole, it is observed that all the 12 measures are common in the two lists. Only the relative ranks of some measures within top 12 are different. For example, though customer satisfaction remains the top-most important measure in both analyses,

employee satisfaction moves up to 3rd rank (as against 4th rank for all consulting firms). Other measures like reuse rate of existing knowledge/ best practices, availability of a knowledge sharing/ dissemination mechanism and ROI also move up a little in rank order. However since the proposed framework for KM performance measures includes all of the top 12 measures, it would yield the same results computation of KMPI (Knowledge Management Performance Index – explained in chapter 4.)

Interestingly, as for the whole consulting domain, none of the top 12 measures for IT consulting segment is from the 'technological' category. This again reinforces the viewpoint that for the relatively 'mature' IT consulting sector in India, *Knowledge Management is not primarily technology; it is more a business and corporate issue.*

For areas other than IT consulting, 25 clearly identifiable responses from 19 firms operating in engineering and infrastructure consulting, management consulting, education consulting, HR and legal consulting, etc were analysed. The limitations of small sample size would also reflect here – particularly because this data sub-set is not so homogeneous (because of diverse areas of operations). Notwithstanding this, with an intention to identify significant measures common to both data sets (IT consulting vs. others), the corresponding top 12 measures for non-IT firms were arrived at as follows:

1 Availability of a Quality Management systems/practices documentation
2 Customer satisfaction
3 Availability of a knowledge sharing/ dissemination mechanism
4 Return on Investment ROI (%)
5 CEO's personality/ leadership style
6 Availability of company wide collaborative/messaging/workflow tools
7 Availability of company's stated 'Vision'
8 Availability of an employee experience recording mechanism
9 IT investments (Rs.)
10 Communications investments (Rs.)
11 Availability of a competency mapping mechanism
12 R&D investments

On comparison of above list with the top 12 list for IT consulting firms, following 6 factors come out to be **common** – regardless of the heterogeneity of this data sub-set.

- Availability of a Quality Management systems/practices documentation
- Customer satisfaction
- Availability of a knowledge sharing/ dissemination mechanism
- Return on Investment ROI (%)
- CEO's personality/ leadership style
- Availability of company's stated 'Vision'

Analysis of responses from non-IT sector firms reveals significantly that apart from the above measures, non-IT consulting firms perceive high importance to technological factors like IT investments (9th rank), communications investment (10th rank) and R&D investments (12th rank). This is rather in sharp contrast to the perceptions of IT consulting firms for whom, none of the technological factors finds a place in top 12 – as also for the consulting domain as a whole. Perhaps this observation explains the *myth* about KM being technology-centric for the firms who are not so 'mature' as IT consulting firms in India, about their understanding about KM. These firms are likely to give undue importance to technology investments[1] and relatively neglect other important measures like KM's integration with strategy, reuse rate of existing knowledge/ best practices, employee satisfaction, etc.. On the other hand, IT consulting firms in India – who have already made a mark on global scene – give more importance to these non-technological measures belonging to corporate, human/competency and market related categories, rather than technological investments.

Since the top 12 list of measures for IT consulting sector matches with the top 12 list for the consulting domain as a whole and since the IT consulting sector's marked performance at the global level is well known, the above analysis leads to the following implications:

1. The Framework of KM performance measures proposed in this research based on the top 12 measures mentioned in Table 5.2 can be confidently

[1] While discussing on the issue of technological factors, it is mentioned here that Part I of the questionnaire (Appendix A) had originally intended to capture the data on IT investments relative to the revenue, while seeking the information on organisational profile. However, the response to this question was inadequate (only 23 firms responded out of 57) despite personal follow-up with the respondents. Even out of the available response, the figures on IT investments mentioned were given without referring any documentary evidence and hence were not considered suitable for further analysis. For majority of organisations, company confidentiality was cited as the main reason for leaving out this information

implemented straightaway (for computation of KMI, KMP and KMPI values) – particularly for IT consulting firms.

2. Though further research studies may be desirable for identification of top 12 measures separately for each other sector – say, management consulting, engineering projects consulting, etc. - pending that, the same framework can also be applied for any consulting firm from any sector. This is because the top 12 measures incorporated in the proposed framework are the same for consulting domain as a whole as for IT consulting sector, which has already displayed 'maturity' of business performance at global level. The case study of Tata Consultancy Services (TCS) covered in detail subsequently, illustrates the validity of the proposed framework for the largest IT consulting firm of Asia.

Indian Firms vs. MNCs

The top 12 important measures for the 47 identifiable responses from 22 Indian firms are given below along with the corresponding computed 'z' values (for illustration of rank-order relationship -- descending order of importance corresponds to ascending order of 'z' values):

Rank	KM Performance Measure	'z' value
1	Customer satisfaction	0.00
2	CEO's personality/ leadership style	0.76
3	Return on Investment ROI (%)	0.80
4	Availability of company's stated 'Vision'	0.82
5	Employee satisfaction	0.94
6	Availability of a Quality Management systems/practices documentation	0.95
7	Availability of a knowledge sharing/ dissemination mechanism	1.09
8	Reuse rate of existing knowledge/ best practices (%)	1.65
9	Annual revenue growth (%)	1.85
10	Image	1.90
11	KM integration with strategy	1.92
12	R&D investments	1.92

On comparison with the top 12 list for the consulting domain as a whole, as many as 11 measures are found to be common. (excepting 'R& D investments' at rank 12 in the above list, which is ranked 16 in the importance order for all consulting firms.) With 11 factors matching in the top 12 list for both data sets, the representativeness of the proposed framework for Indian consulting firms across all segments is on sound footing.

The responses from India-based firms with MNC parents was rather small (12 responses). Though the statistical treatment for significance testing was correspondingly applied for small samples ('t' statistic), the outcome of analysis has to be viewed in that light. Nevertheless, to find out the unique distinguishing factors of MNC firms, the top 12 list for MNC firms was arrived at based on ascending order of 't' values compared to the 5% significance values of 't', as follows:

Rank	KM Performance Measure	't' value	't' ref.(5%)
1	Availability of a knowledge sharing/ dissemination mechanism	0.00	-----
2	Availability of a Quality Management systems/practices documentation	0.12	2.080
3	Availability of a competency mapping mechanism	0.43	2.074
4	Availability of company wide collaborative/messaging/workflow tools	0.72	2.074
5	Availability of an employee experience recording mechanism	0.72	2.074
6	Customer satisfaction	1.06	2.074
7	KM integration with strategy	1.07	2.074
8	R&D investments	1.15	2.074
9	Reuse rate of existing knowledge/ best practices (%)	1.51	2.074
10	Return on Investment ROI (%)	1.60	2.074
11	Ratio of repeat customers to total	1.68	2.074
12	CEO's personality/ leadership style	1.77	2.074

On comparison with the top 12 list for Indian firms, the following four factors come out distinctly unique for MNCs:

- Availability of a competency mapping mechanism
- Availability of company wide collaborative/messaging/workflow tools
- Availability of an employee experience recording mechanism
- Ratio of repeat customers to total

The above four measures are perceived at lower ranks (beyond 12) by the Indian firms. Though the sample size for this data set is small, pending further research, it can be

observed that Indian firms perceive relatively lesser importance to the need for an appropriate competency mapping mechanism (ranked 24) and employee experience recording mechanism (ranked 19) compared to MNC consulting firms. However more research has to go into this aspect before drawing any inference - in view the small sample of MNC firms, despite the rigour of statistical treatment (comparison on 't' test statistic for comparison of small sample means).

Table 5.4 gives the ranks for all the 47 measures investigated at the field research stage for detailed reference. The ranks are given for all 8 data sub-sets discussed above, as well as for the whole data set comprising all 108 responses. The table is sorted on the importance ranks for the whole consulting domain. *The top 12 measures from this table go into the construction of KM performance framework explained in next section.*

Table 5.4: Rank Orders of KM Measures for All Data Sub-sets

Factor	Ease	All firms	KM Firms	Non-KM	KM review	No review	Indian Firms	MNC Firms	IT Firms	Others
• Customer satisfaction	2	1	1	3	1	1	1	6	1	2
• CEO's personality/ leadership style	3	2	7	1	7	16	2	12	8	5
• Return on Investment ROI (%)	4	3	2	6	2	6	3	10	2	4
• Employee satisfaction	2	4	8	5	4	22	5	21	3	13
• Availability of a knowledge sharing/ dissemination mechanism	2	5	3	7	3	3	7	1	4	3
• Availability of company's stated 'Vision'	3	6	10	4	11	14	4	25	6	7
• Availability of a Quality Management systems/practices documentation	3	7	6	2	9	8	6	2	11	1
• Image	2	8	19	9	22	10	10	31	12	17
• Reuse rate of existing knowledge/ best practices (%)	2	9	4	23	5	13	8	9	5	16
• KM integration with strategy	2	10	11	8	8	17	11	7	9	14
• Annual revenue growth (%)	4	11	15	12	21	4	9	29	10	22
• New orders (No.)	4	12	13	16	18	5	15	27	7	28
• Availability of company wide collaborative/messaging/workflow tools	3	13	5	10	12	2	13	4	14	6
• IT investments (Rs.)	4	14	16	24	15	12	16	17	24	9
• Ratio of repeat customers to total (Ratio)	4	15	18	14	16	15	17	11	13	23

• R&D investments /revenue (Ratio)	3	16	9	15	6	20	12	8	15	12
• Availability of a competency mapping mechanism	2	17	12	21	14	7	24	3	17	11
• Market share (%)	4	18	17	25	20	11	23	18	16	18
• Availability of an employee experience recording mechanism	3	19	14	13	17	9	19	5	19	8
• New ideas of employees implemented (No.)	2	20	22	20	10	46	22	22	20	26
• Employee Value Added EVA (Rs.)	2	21	20	18	13	26	18	14	18	15
• Communications investments (Rs.)	4	22	23	22	24	21	21	24	30	10
• Certifications by industry/standards bodies	4	23	26	11	27	23	14	44	22	25
• Success ratio for new bids (Ratio)	3	24	30	28	31	28	26	41	28	29
• Training on KM practices (Days)	4	25	24	27	19	35	25	15	23	24
• Time saved in creating new proposals	2	26	21	19	23	18	28	13	21	19
• Av. amount of rework/rejects (%)	2	27	25	37	25	25	29	16	26	33
• Industry accreditation	3	28	27	17	29	19	27	36	25	27
• Av. training imparted per year (Days)	4	29	28	35	28	31	31	34	27	40
• Av. experience of employees (Years)	4	30	29	26	30	30	20	35	29	21
• Training/ competence development spending : Av. per employee (Rs.)	4	31	31	38	26	39	30	32	32	31
• Duration of KM functioning (Years)	3	32	33	30	32	36	32	19	36	20
• Staff dedicated for KM function (No.)	4	33	34	33	33	34	35	26	34	34
• Av. orders per customer (No.)	4	34	35	31	35	29	33	28	31	35
• Time spent on project closing reports	3	35	32	39	34	24	37	30	33	32
• No. of executive levels in hierarchy	4	36	38	29	37	40	34	38	35	36
• Patents held & pending (No.)	4	37	37	36	39	27	38	20	37	39
• Duration of Web-based functioning (Years)	4	38	39	34	41	32	36	42	41	30
• Av. expenses per unsuccessful bid (Rs.)	2	39	40	46	40	37	46	45	39	46
• No. of direct reports to CEO	4	40	42	42	42	42	42	43	40	43
• Total papers published per year (No.)	4	41	36	44	36	33	41	23	38	44
• Library investment per employee (Rs.)	4	42	41	41	38	43	43	33	42	37
• Total no. of invited talks per year (No.)	4	43	43	45	43	41	45	40	43	45
• Seminars organised by company (No.)	4	44	44	43	45	38	44	39	44	42

• Av. age of employees (Years)	4	45	47	32	46	47	39	47	45	38
• Tobin's Q (Ratio of market value of firm over cost of replacing physical assets)	2	46	46	40	47	44	40	46	47	41
• Average age of patents held (Years)	4	47	45	47	44	45	47	37	46	47

5.4 Discussion on Construction of the Framework of Performance Measures

Using the top 12 measures from the above table, a *Framework of KM Performance Measures* is constructed here with the help of illustrative case studies of 4 diverse consulting firms. As explained earlier in Chapter 4, this conceptual framework comprises of a functional index 'KMPI' ("*Knowledge Management Performance Index*") as well as a pictorial representation either in 'radar chart' or a 'bar chart' formats. However in this chapter, only the 'radar chart' format is used because the case study respondents preferred the 'radar charts' over the 'bar chart' format

a) Functional Index KMPI

As explained in Chapter 4 earlier, the framework proposed by this research involves computation of the relative value of a 'functional index' titled *Knowledge Management Performance Index* (KMPI). This is arrived at by a functional relationship

KMPI = KMP x KMI

Where:

KMPI is Knowledge Management Performance Index. It is an aggregate relative measure of KM 'performance' of the company (with respect to the 'benchmark' value preferred by the company for monitoring its own performance) *as well as* the relative KM 'intensity' of the company (using the reference base of consulting domain as a whole or its specific area of consulting operations.)

KMP is relative value of *KM performance* with respect to the chosen benchmark. For the illustrative case studies given in next section, top 12 important measures were considered for performance monitoring with reference to the benchmark value. For illustration, the benchmark chosen is the *'company's own performance*

in the preceding year'. This is because all the 4 firms studied mentioned this as one of the common benchmarks, along with other desired benchmarks (competitors, industry average, etc.). The product of 'change ratios' (i.e., 1.00 signifies no change; 1.20 signifies 20% improvement over benchmark; 0.85 signifies 15% deterioration of that factor against benchmark) of each of the top 12 important factors gives KMP for a company.

KMI denotes the relative *KM intensity* of the company with respect to either the industry average for the company's area of operation or with respect to the averages across all industry/ sectors in consulting services domain. This is an indication of how important KM activity is for the company's business - with reference to the aggregate industry/ sector or the consulting business as a whole. *Higher the value, more is the need for putting an effective measure of KM performance.* However lower value of KMI does not indicate poor performance of the company; it just indicates that KM monitoring need not be critical for this company at this stage. For the illustrative purpose of the framework, KMI is computed with respect to the averages across all industry/ sectors in consulting services domain. However interactions during case studies also suggest choosing the industry/ sector aggregates as the base for comparisons. The value of KMI is relative to 1. (For example, KMI value of 0.25 suggests rather lower knowledge intensive company; value 2.07 indicates a highly intensive company requiring close KM performance monitoring.)

b) Pictorial Presentation of the Framework

The other representation format for the framework is construction of the "*radar charts*". The radar charts for KMI and KMP for two case firms studied in depth are given in next section.

5.5 Illustrative Case Studies

The set of 'top 12' KM performance measures formed the baseline for the framework of KM performance measures constructed as above. Apart from proposing the framework,

the research also included illustrative validation of the same through case studies of as many as 4 consulting firms based in India (though initially the concept validation of the framework was intended to be done with only 2 consulting firms).

The comparative observations on relevant aspects of KM practices are given for all 4 firms in Table 5.5. In addition, detailed narration and in-depth analysis is done for 2 firms – one as a suitable candidate for following purely *codification* strategy for KM and the other also following *personalisation* approach for its KM activities. Additional secondary information (trade publications, web resources, company literature, etc.) was referred for these two firms detailed in Appendix D.

Table 5.5: Comparison of Case Firms

	Tata Consultancy Services (TCS)	**Engineers India Ltd. (EIL)**	**Kale Consultants**	**RITES Ltd.**
Area of operation	IT consulting/ Software services in various segments	Engineering projects consulting in oil sector	Software services in banking & airlines sectors	Transportation & Infrastructure projects consulting
In operation since	1968	1965	1986	1974
Ownership	Private Sector	Public Sector	Private Sector	Public Sector
Revenue (2002-03)	Rs. 5012 crore	Rs. 818.8 crore	Rs. 54.5 crore	Rs. 321.5 crore
Employees as on 31.03.2003	23,854	2,889	607	Over 1,000
Formal KM system existing?	***Yes; for over 5 years***	*Yes, at some divisional levels*	*Being put in place*	***No***
Level of KM responsibility at	At Head of Industry/ Service Practice (IP/SP) level	Group Leader level (lower than Divisional head)	VP level	NA
Does KM contribute to	***Yes***	*No*	*No*	***NA***

business strategy/ corporate planning?				
System for KM review exists?	Yes; through an internal system "eKMS"	No	Yes; through an internal system "Iplan"	NA
Documentation of internal ideas/ 'best practices' done?	Yes; through "structured methods" and "focussed guidelines"	No	Yes; by an internal entity BPG (Best Practices Group)	Yes; as part of project documentation. However no formal system
Credit given for knowledge sharing and documentation in appraisal system?	Yes	No. (However credit given for knowledge upgradation)	Yes, however at some limited hierarchical roles only	Yes, as a part of project review
Suitable KM appraoch	Codification + Personalisation (for management consulting jobs)	Codification	Codification + Personalisation (for talent outsourcing)	Codification
Preferred benchmarking target(s)	"Global Top10" consulting firms like McKinsey	Competitors e.g. Bechtel, Kellog, etc.	Competitors like iFlex, Infosys, etc.	*Firm's own earlier performance*
Illustrative KMI (w.r.t. all firms)	2.07	1.77	1.75	1.57
Illustrative KMP (w.r.t. benchmark of last year)	3.86	0.90	0.43	0.39
Illustrative KMPI (=KMP*KMI)	**8.01**	**1.59**	**0.76**	**0.62**

Two noteworthy aspects are evident in the above comparisons- as highlighted in bold. The first is that TCS – Asia's leading IT consulting firm - has been having a formal KM

system in operation for over 5 years. It also has a KM review system in place, to monitor the effectiveness of its KM activities. On the other hand, RITES – a consulting firm in transportation sector - does not yet have a formal KM system in the company, though the practice of project documentation does exist in the company. The second aspect is that for TCS, KM is an important contributing element for its business strategy unlike for RITES where this aspect is non-existent as a formal mechanism. If these two major aspects are considered in the background while interpreting the illustrative 'KMPI' values (8.01 for TCS and 0.62 for RITES), the concept of the recommended framework of KM performance measures gets understood.

Table 5.6 explains the details of computation of KMPI values for the 4 firms – including two firms --TCS and RITES Ltd.-- studied in-depth. The choice of these two firms was deliberate, to provide insight into the 'contrasting' aspects related to KM practice and applications, as mentioned in Table 5.5. The detailed background information about the two case firms is given separately in Appendix D. However the pictorial representation of the framework is given here in Figures 5.1 to 5.4 in respect of KMI and KMP charts for these.

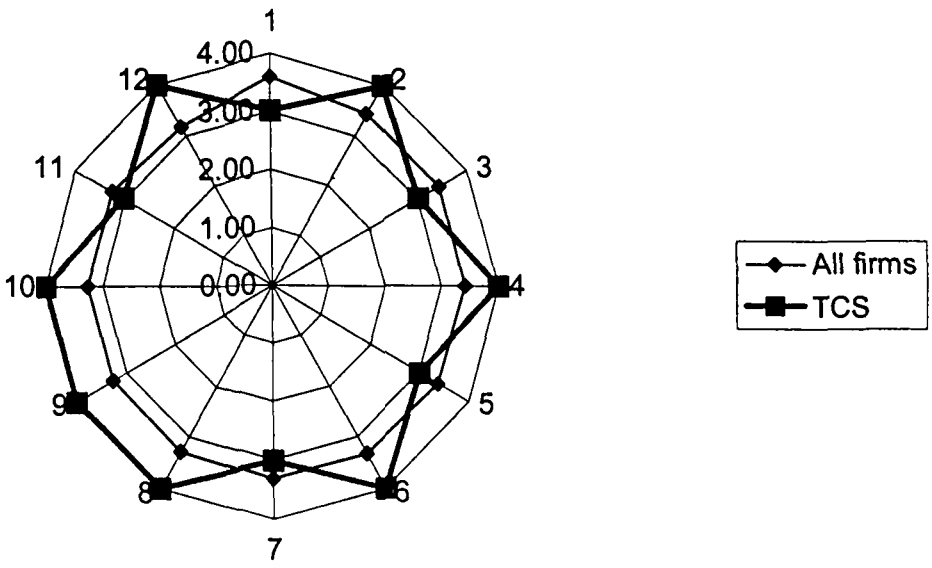
Table 5.6: KMPI Computation for Case Firms

Rank	Factor	Factor Importance					KM Intensity (factor-wise) for firms					Factor Performance for Firms (over last year)				
		Overall	TCS	EIL	Kale	RITES	TCS	EIL	Kale	RITES		TCS	EIL	Kale	RITES	
1	Customer satisfaction	3.60	3.0	3.5	4.0	3.9	**0.83**	0.97	1.11	**1.08**		**1.25**	1.05	1.30	**1.10**	
2	CEO's personality/ leadership style	3.42	4.0	3.7	3.0	3.0	**1.17**	1.08	0.88	**0.88**		**1.00**	1.00	1.00	**1.05**	
3	Return on Investment ROI (%)	3.43	3.0	3.1	3.5	3.4	**0.88**	0.90	1.02	**0.99**		**1.20**	0.86	1.49	**0.85**	
4	Employee satisfaction	3.42	4.0	3.3	3.8	3.5	**1.17**	0.97	1.11	**1.02**		**1.01**	0.90	1.20	**1.10**	
5	Availability of a knowledge sharing/ dissemination mechanism	3.37	3.0	3.8	3.4	3.2	**0.89**	1.13	1.01	**0.95**		**1.20**	1.00	1.40	**1.00**	
6	Availability of company's stated 'Vision'	3.32	4.0	3.5	3.7	3.5	**1.20**	1.05	1.11	**1.05**		**1.30**	1.00	1.00	**1.05**	
7	Availability of a QMS documentation	3.31	3.0	3.9	3.6	3.5	**0.91**	1.16	1.09	**1.06**		**1.30**	1.12	1.30	**1.10**	
8	Image	3.27	4.0	3.8	3.5	3.6	**1.22**	1.15	1.07	**1.10**		**1.40**	0.95	1.20	**1.15**	
9	Reuse rate of existing knowledge/ best practices (%)	3.27	4.0	3.2	3.2	3.5	**1.22**	0.98	0.98	**1.07**		**1.10**	1.04	1.10	**1.00**	
10	KM integration with strategy	3.26	4.0	3.4	3.2	3.8	**1.23**	1.04	0.98	**1.17**		**1.00**	1.00	1.00	**1.00**	
11	Annual revenue growth (%)	3.24	3.0	3.5	3.6	3.5	**0.93**	1.08	1.11	**1.08**		**0.71**	1.00	0.02	**0.23**	
12	New orders (No.)	3.17	4.0	3.5	3.6	3.3	**1.26**	1.11	1.14	**1.04**		**1.15**	1.00	4.00	**1.20**	
						KMI >>	**2.07**	1.77	1.75	**1.57**	**KMP>>**	**3.86**	0.90	0.43	**0.39**	
										KMPI (=KMP *KMI)	**>>>>**	**8.01**	1.59	0.76	**0.62**	

KMI is computed as the product of KM 'intensity ratios' (w.r.t. averages across all industry/ sectors) for top 12 factors. The value of KMI is relative to 1.

KMP is the product of 'change ratios' (w.r.t. the firm's own performance in previous year) for each of the top 12 factors. The value of KMP is also relative to 1.

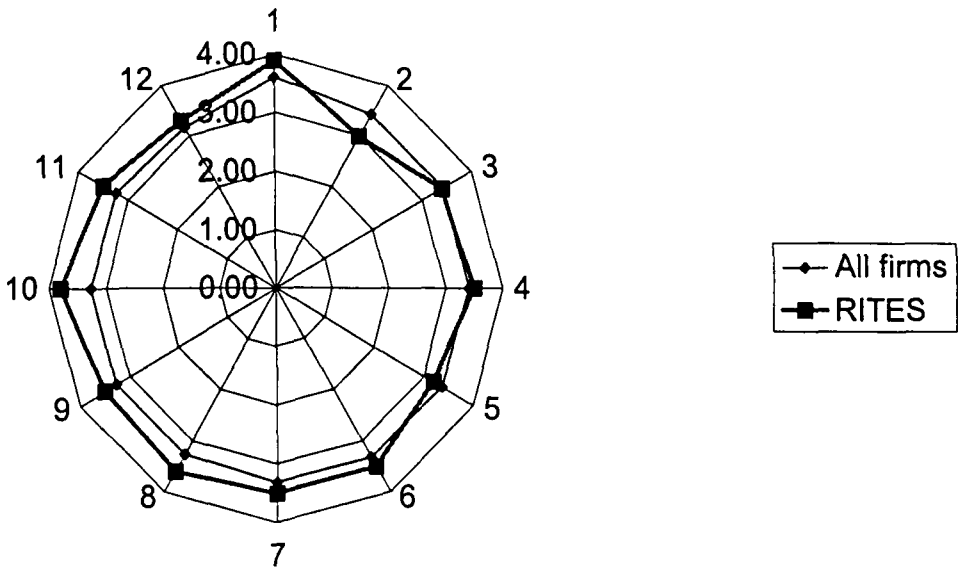
Figure 5.1: KMI Chart for TCS



This chart acts as a 'radar' for CEO of the company to monitor its *KM intensity* on top 12 KM measures (as listed in Table 5.2 earlier). For example, without going into computational details, CEO can visually interpret from the KMI chart that compared to all the consulting domain (or even all IT consulting sector), presently his company gives relatively higher importance to KM measures ranked 2, 4, 6, 8, 9, 10 & 12. However it has to be 'vigilant' about the relatively less importance being given to measures ranked 1,3, 5, 7 & 11. While working on its business strategy and corporate plans, this becomes an important input for the CEO.

The illustrated KMI chart for RITES given below can be interpreted similarly.

Figure 5.2: KMI Chart for RITES

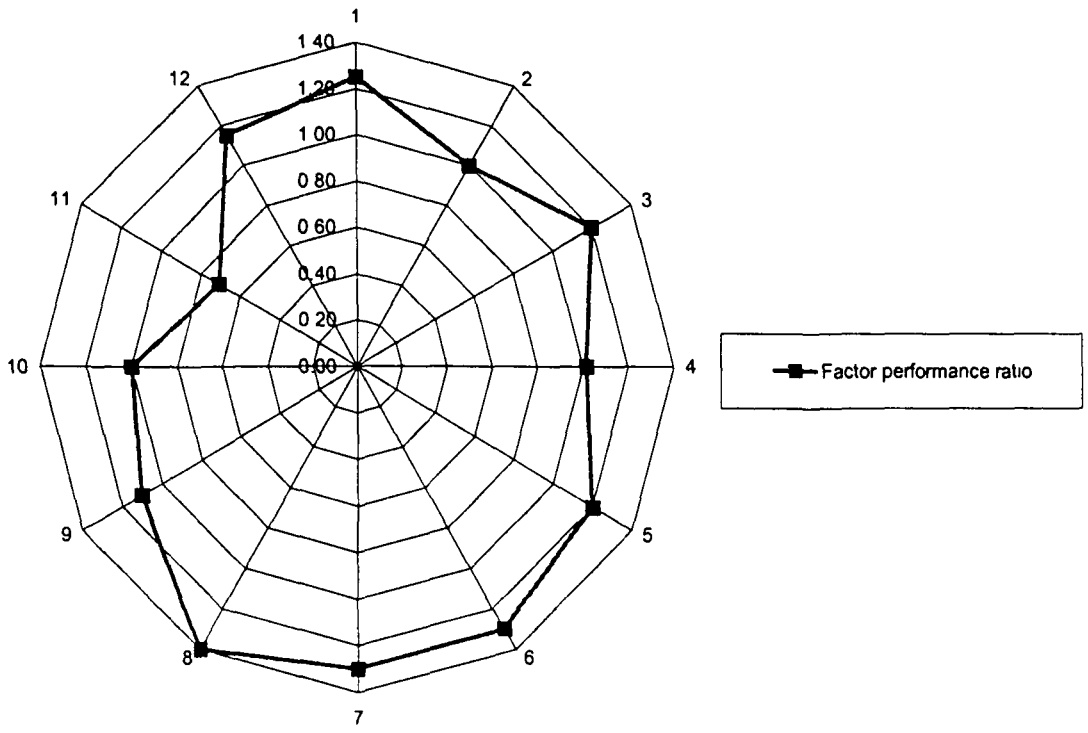


Similar in pictorial presentation to KMI chart, but different in its content, the KMP chart portrays visually the *performance* of the firm over 12 KM measures, compared to the pre-decided benchmark. For illustration of the concept here, company's own performance over previous year on each of the top 12 KM measures gets reflected in the KMP charts. However while adopting or implementing the KM performance framework on an on-going basis, the companies can compare their performance with the nearest competitor or the particular industry sector aggregates.

The KMP chart for TCS given below in Figure 5.3 enables its CEO to readily infer that the company did well over last year for KM measures ranked 1,3, 5, 6,7,8 and 12. For other measures, the company has to critically examine its performance over last year. Unlike KMI chart portraying the KM intensity of the firm, KMP chart provides input to its CEO on performance over key measures. For example, CEO can readily see that customer satisfaction and company's image improved significantly over last year, but the revenue *growth rate* was not as high as last year. So both these 'radar'

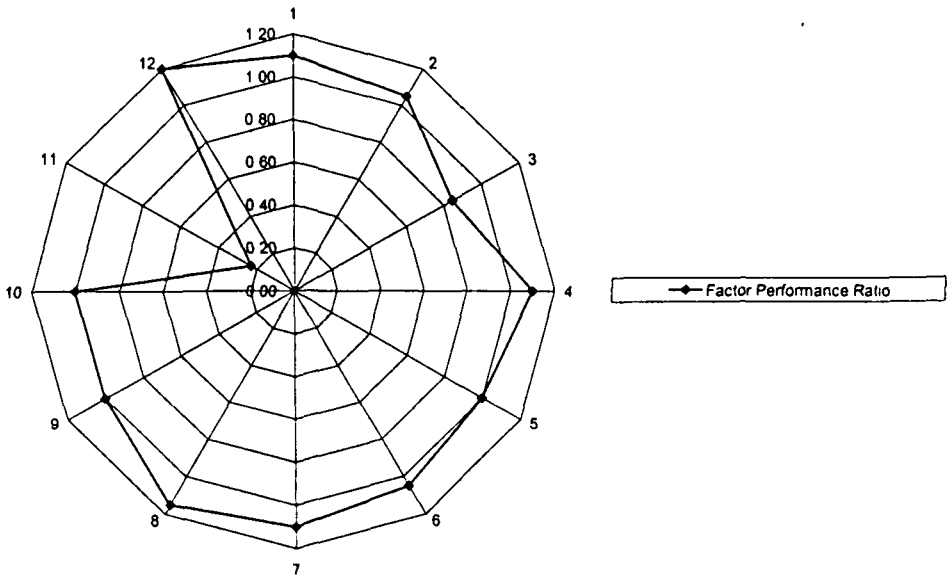
charts – KMI and KMP charts – if placed behind CEO's desk, act as a visual reminder to him about the state of KM effectiveness in his company.

Figure 5.3: KMP Chart for TCS



The corresponding KMP chart for RITES is given in Figure 5.4. This chart too portrays a significant dip in revenue *growth rate* (measure ranked 11) for the company over last year. On closer scrutiny of annual reports, this significant dip was explained. Total income of RITES increased in 2002-03 to Rs. 321.51 crore from Rs 283.37 crore in 2001-02 (growth rate of 13.4%). However income in 2001-02 was just Rs. 187.75 crore – implying a much higher growth rate of 56.8% for the previous year 2001-02. So while the company's income increased, its growth rate fell to about 0.23 of previous year benchmark. Such variations in performance measures get effectively portrayed in KMP charts.

Figure 5.4: KMP Chart for RITES



5.6 Discussion on Optional/ Unstructured Responses

In part I of the questionnaire seeking primary data, one of the key questions related to those of the responding firm who mentioned already having a KM function established in their organisations. This question was designed in a 'semi-structured' manner, as follows:

> *"Is there a system for ongoing review of the effectiveness of KM in your company?*
>
> *[] Yes [] No [] Not known*
>
> *If 'Yes', please describe briefly the same (say, 100-150 words) particularly indicating the major factors used by your company for evaluating the performance of KM programmes. An idea about the implementation success of your KM system would particularly be useful for this research. Any write-up on KM performance measures, if available, may be attached. (Confidentiality is assured.)"*

22 firms said 'yes' in answer to the first part of above question. Out of those, a few also offered some more information/ comments about their system for review of KM effectiveness in their company. Some responses are reproduced below (emphasis added in bold), as these are considered significant to present research topic. However,

specific identities of respondents are not revealed to keep up the commitment for maintaining confidentiality.

*" **We don't have a "formal" way of evaluation for the performance of KM.** Our whole KM initiative is available on our intranet on every department's site. All the documents, forms, articles, links etc...everything is available. We also have our knowledge net where few people from each groups are authorized to put the relevant learnings from field and engineers. Everyone is supposed to send stuff to these people. They verify and then put it in web form.* ***People are rewarded for sharing their learnings.*** *"* (MNC firm in IT sector)

"Surveys have been conducted in the past for analysing the effectiveness of KM practices and databases. ***However the effectiveness of the surveys have not been shared.*** *Most of KM tools have been used for IT consulting.* ***Very few KM tools for non-IT based consulting services.*** *"* (MNC firm in IT consulting as well as management consulting sectors)

"Surveys are carried out to judge the effectiveness of the KM program. This survey focuses on the quality of the content available in our repository, the number of times it was accessed in a certain period, for what purposes the content is used, how relevant was the content, how readable was the content, etc.
We follow the KMM model to gauge the effectiveness of the KM program. *"* (a leading Indian IT consulting firm with global operations)

"KM is particularly important for a consulting firm like ours. Information is categorized under various heads and internal processes/incentives ensure that we capture both explicit as well as tacit knowledge of individuals. Some of the ***major factors used to evaluate the performance of KM are-***

- ***Tracking of database usage by the associates***
- ***Regular feedback on the content/information that is stored, accessibility and ease of updation by individual associates.*** *"* (MNC firm in HR consulting)

"Being ISO 9001:2000 company, we defined procedures to manage and analyse issues on knowledge and intellectual property issues on regular basis of various levels of organizational functioning. (Indian firm in IT sector)

"We have a system of Sharenet where knowledge and experiences world over are shared to solve problems. ***There is a system for evaluation of gains.... and there are incentives*** *for*

maximum savings achieved through use and annual awards are also distributed "(Telecom consulting firm)

" *# of knowledge assets contributed per person per month*
# of knowledge assets used (downloaded) per person per month
Reduction of cycle time in core or critical processes including service delivery, sales, support, etc
Increase in per person productivity in core or critical processes
Increase in service levels in core or critical processes. "(IT consulting firm)

" *Each employee participates yearly in an extensive review process where feedback on effectiveness of various KM channels is solicited In addition, there are periodic reviews with representative groups that are primary users of different KM tools Also, any user can submit their comments/suggestions regarding a KM entity at any time*
The key factors covered in the review process are- usability and relevance of information to the job at hand, accessibility of the right information in timely manner, response time to various actions administered using KM tools.
I would rate the success of KM system in my company as slightly above average There are several shortcoming in the system despite a pretty active review process-search mechanisms are not exhaustive and intutive, multiple data bases providing different information on the same topic, etc "(Telecom infrastructure consulting firm)

" *In our organisation we have business units leadership It wholly supports the implementation of a KM strategy and to ensure its success,* ***we have been working on metrics that are used to measure the success of the implementation*** *These metrics are used to gauge areas that may need to be updated to better fit the needs or usage patterns of the employees within the organisation "*(Legal/ management consulting firm in India)

" *This is being done at different levels*

- *Organisation (Shared world wide web site, Earlier experiences)*
- *Project (Sharing Documents on the Project, Common Project Calender)*
- ***Individual (Annual Assessment)***"(MNC firm in management consulting)

" *There are separate teams* geographically *dispersed across the world who are responsible for collating and contributing to the Knowledge Exchange The evaluation of the performance of various Knowledge Databases also forms part of their responsibility"*(MNC management consulting firm)

*"KM is totally automated that takes into account the **Business Contribution Factor as a measure of success for Presales, Technical Contribution factor for projects and Best practices for processes**"*(Telecom consulting firm)

"

- *Weekly schedule of the knowledge practices*
- *Weekly reviews*
- *Knowledge updates for staff concerned*
- *Monitor progress on a monthly basis. Knowledge Vs Attainment*
- ***Utilize knowledge base from time to time vis-à-vis performances of individuals***"(MNC firm in IT consulting)

"

- *Those who raise important queries frequently and contribute with their expert domain knowledge would be suitably rewarded by company.*
- *A motivation committee has been set up exclusively to deal with Knowledge Management initiative.*
- *The information, which is stored in the repository, **can be judged for quality by the number of people who use a particular document. Popular associates are awarded so as to encourage them**.* "(MNC firm in IT sector)

" Keeping an eye on the performances of the key personnel related to sharing information amongst staff.
Visualizing for the future for better knowledge sharing
An internal pattern created for improvising knowledge base"(Indian IT consulting firm)

"Dedicated groups like Quality management groups in all key branches monitor the KM activities"(Leading Indian IT consulting firm with global operations)

While the relevant feedback about KM review system are highlighted in bold, broadly the pattern emerging from the unstructured comments is as follows:

- There are very few firms having a formal review mechanism for KM effectiveness. Even among the firms who have given the feedback voluntarily, the *review mechanism for most of them is not specific to KM measures.*

- Out of those few firms claiming to have some working review mechanisms for KM activities, MNC firms - particularly having global operations- appear to have some formal systems specific for KM review. The implication is that MNC firms have definitely a competitive edge here and Indian firms can look towards them for specific study. Unfortunately however, the same reason becomes the deterrent. MNC firms don't open up their review system for study by other firms because of fear of loosing their competitive edge. That's particularly understandable for consulting firms for whom a good KM system can really be the distinctive competitive asset.
- Almost all the firms claiming to have some system for review of KM activities belong to IT/telecom consulting or management consulting sectors. It is noteworthy that no firm from engineering consulting or infrastructure projects consulting have mentioned anything about the KM review mechanism working in the company.
- Most of the firms having working review systems for KM haven't disclosed the KM measures being deployed for assessing their KM effectiveness. However, some others have only indicated broadly the review parameters and procedures. No firm enclosed any write-up about their KM review mechanism, despite the request in the questionnaire as well at personal interview stage. Hence this research could not get any direct benefit from these 'unstructured comments' to go into the recommended framework.

Another set of optional responses in unstructured format was solicited in Part II of questionnaire - towards the end - as follows:

> *"Any other relevant factors which are not included above:"*

The idea was to ensure that no major KM measure is missed out while listing 47 measures in 5 categories (Financial, Market/customer related, Human/competency

development, Corporate leadership/strategies/practices and Technological). If a sizable proportion of sample size had listed some additional common factors, the same could have been considered for further study and analysis. However, just 8 respondents opted to give their thought about other factors, out of 108 respondents. The 'factors' thought to be relevant by them as possible KM measures along with their perceived ratings on 4- point scale on *importance* and *ease of measurement* of suggested factors, are given in Table 5.7.

Table 5.7: Additional 'Factors' Suggested by Respondents

'Factor' suggested by respondents	'Importance Rating' suggested by respondents	'Ease of Measurement' Rating suggested by respondents
Staff commitment	4	2
Employee rewards programme	4	4
Celebration of successes	4	4
Suggestion scheme	4	4
Small group activities	4	4
ESOP	4	4
Performance review	3	3
On the job train[illegible]g	4	3
Job orientation	4	3
Team work potential	3	3
Team for KM activities	3	3
Existence of matrix organisation	4	2
Availability of *Informal* forums for sharing knowledge	4	1
Mechanism for mapping the company's mission, goals and objectives to relevant knowledge domains and then mapping the same to	4	2

individual competencies		
User Department's participation in competency development	3	2
Knowledge of KM practices	4	3
Ease and effectiveness of availability of relevant material	4	3

Each of the above factors was suggested by a single respondent only – implying that out of 108 responses, not more than one response could be attributed to any of the above suggested factors. On closer scrutiny it is evident that excepting the factors highlighted in bold, other factors already appear among the 47 listed in the questionnaire – albeit in differing language. For example, '*Team for KM activities*' suggested above is already covered as ' *Staff dedicated for KM function*' as a factor listed under Corporate leadership/strategy/practices category. '*On the job training*' suggested above is already listed as the factor '*Average Training imparted per year (Days)*' listed under Human/competency development category. Similarly '*Mechanism for mapping the company's mission, goals and objectives to relevant knowledge domains and then mapping the same to individual competencies*' is already listed as the factor '*Availability of a competency mapping mechanism*' under the category of Corporate leadsership/strategy/practices.

Another set of suggestions like '*Celebration of successes*' or '*Job orientation*' or '*Existence of matrix organisation*' are not amenable for being treated as KM performance measures – in the manner of 47 candidate factors listed in the survey.

However the factors highlighted in bold do appear to have some merit for being considered as the possible candidate measure of KM performance. Some factors suggested do particularly reflect the insight and knowledge of the respondents in KM field and thus have an intuitive appeal. As an example, the factors '**Availability of *Informal* forums for sharing knowledge**' or 'availability of a **Suggestion scheme**' or **ESOP** are the factors that the consulting firms may look into. However since for

each of these factors, only one respondent felt it so, these did not appear in the final framework based on top-12 KM measures - arrived at after rigorous statistical analysis of 108 responses.

5.7 Summary

This Chapter dealt with the statistical analysis of the primary data collected at the field at Stage I of the research and then discussed the construction of the "Framework of KM Performance Measures". The 'core data' analysed was the 'perception' of 108 respondents about 'Importance' and 'Ease of Measurement/ Assessment' on a 4-point scale - for each of the 47 factors listed in the questionnaire. Various data sub-sets were formed from the whole data set of 108 respondents from 57 organisations and the corresponding outcomes of comparative analysis of various possible pairs of data sub-set were arrived at. Observations were made on the comparison of the status of KM practice and review mechanisms, area of consulting operation and Indian vs. MNC firms.

The primary data analysis resulted in coming out with a *ranked list* of important measures of KM performance, which formed the premise for the recommended "Framework of KM Performance Measures". The structure of the recommended framework – as functional index KMPI, as well as KMP and KMI 'radar chart' presentations - was discussed in detail using the comparison of 4 firms as 'case studies' for illustration. Background information about two case firms studied in detail is given in Appendix D.

The optional/ unstructured responses obtained at the data collection stage were also discussed and observations made on their significance and relevance. This unstructured information studied was by way of the respondents' feedback on the review mechanism of KM systems in their firms and also some suggestions for 'factors' to be considered additionally as candidates measures of KM performance.

The Framework of KM performance measures proposed in this research is based on the top 12 measures mentioned in Table 5.2. It is revealing that for the consulting domain as a whole as well as for the IT consulting sector, the list of top 12 KM measures is common and hence the proposed framework can be confidently implemented straightaway for IT consulting firms. The research has also revealed that *just one financial measure (ROI) gets included among the top 12 measures for KM performance, the rest all belong to 'non-financial' categories.* ***Customer Satisfaction is the top-most measure of KM performance for the consulting domain as a whole, as well as for IT consulting sector.*** Other commonly important measures of KM performance across major categories of data sub-sets are Employee Satisfaction and CEO's Personality/Leadership. So now for some reasons, if the management wants to pick just one factor for improved focus on KM, it knows which factor to choose. *It's not ROI – as was traditionally considered – but it is the Customer Satisfaction.* The consequent action to be initiated by management in this case is to put in place a mechanism for measuring/ assessment of customer satisfaction on a measurable scale.

Though further research studies may be desirable for identification of top 12 measures separately for each other sector – say, management consulting, engineering projects consulting, etc. - pending that, the same framework can also be applied for any consulting firm from any sector. This is because the top 12 measures incorporated in the proposed framework are the same for consulting domain as a whole as for IT consulting sector, which has already displayed 'maturity' of business performance at global level. So, as a starting stage, the same list of top 12 KM measures can be deployed for any consulting firm, in the conceptual framework of KM measures proposed.

The next chapter gives concluding comments on the research study by analysing the investigations with reference to the research aims and objectives. The specific recommendations for management are given to implement the proposed framework of KM performance measures. Limitations of the present research and recommendations for further research studies are also given.

Chapter 6:

CONCLUSION AND RECOMMENDATIONS

Chapter 6: CONCLUSIONS AND RECOMMENDATIONS

"Knowledge Management is no longer a luxury for the Indian CEO. It is a necessity that can make all the difference between survival and an early demise"
-- Lester Thurow[1]

6.1 Introduction

This chapter synthesises the detailed observations and insights that emerged from the research, giving concluding comments on the research study by analysing the investigations with reference to the research aims and objectives. To provide the management with useful guidelines to implement the proposed framework of KM performance measures, specific recommendations are given. Limitations of the present research and recommendations for further research studies are also given.

6.2 Achievement of Research Aims/Objectives

This research had aimed at evolving a broad-based approach of performance measurement focussed on knowledge-based organisations like consulting firms. This involved broadening the context of KM performance measurement by investigating the significance of certain non-financial 'qualitative' measures along with the traditional hard 'quantitative' financial measures like Return on Investment.

The objectives of the research as stated in Chapter 1, and corresponding achievements of this research study against each objective, are given below:

Objective 1:

To examine the possible alternative measures of performance for consulting firms

Achievement:

Extensive literature study was done on the related work, prior to the design of the primary data collection questionnaire/ interview schedule. As the outcome of the literature research and the study of secondary data sources, as many as 74 possible measures of

[1] Author of *Zero Sum Society* and *Head to Head*. Professor of economics at Massachusetts Institute of Technology. Quoted in *The Times of India*, August 19, 2003

performance for consulting firms were examined at the stage of design of the field data collection questionnaire.

Objective 2:

To propose certain new, innovative metrics for measuring quantitative as well as qualitative indicators including those from market/customer related, human/competency development, corporate leadership/strategy/KM practices and technology domains.

Achievement:

The original collection of 74 possible alternative measures formed the basic inputs for final design of the questionnaire, through a really insightful 'experience survey' process using the expertise and knowledge of 6 key professionals – as the pre-test exercise. This resulted in identifying 47 measures out of the original 74, for inclusion in the field questionnaire. So in the field survey, the questionnaire/ interview schedule had proposed various new innovative metrics - financial as well as non-financial – as the candidate measures of KM performance in consulting companies. As many as 44 proposed metrics were non- financial, belonging to the categories of market/ customer, human/competency related, corporate leadership/strategy/practices and technological domain. Thus, the respondents at the field research stage had a range of innovative and new metrics before them, to think over and give their responses.

Objective 3:

To evolve an integrated framework of KM based performance evaluation measures for such consulting firms

Achievement:

Chapter 5 has discussed the construction of the recommended framework of KM performance measures for the consulting firms. The structure of the proposed framework - by way of a functional index KMPI as well as pictorial presentation in the 'radar chart' format – was also presented. This structure is based on integrated assessment of KM performance for the company on 'top 12' KM measures evolved through the statistical

analysis of the primary data. The functional presentation of the evolved framework involves computation of the values of Knowledge Management Performance (KMP) and Knowledge Management Intensity (KMI), based on the relative values of all top 12 measures. Likewise, the KMP and KMI charts also depict pictorially all the 12 important measures in an integrated presentation.

Objective 4:

To validate the concept and structure of the evolved framework through illustrative case studies.

Achievement:

The concept validation of the framework was done with 4 consulting firms based in India. The comparative observations on relevant aspects are discussed for all 4 firms in Chapter 5. In addition, detailed narration and in-depth analysis is done for 2 firms – as the 'study of the contrast' as given in Appendix D. The KMPI values for the case firms computed through the recommended framework validate the concept, if compared relatively. The structure of the framework – as the functional index KMPI, as well as the radar charts – was well appreciated by all the case firms studied. They indicated the ***ease of understanding and implementation*** as the strong point of the recommended framework.

6.3 Recommendations for Implementation of the Framework

In order to make the research useful to management of consulting firms, actionable recommendations are presented below. These relate to the actions recommended as pre-requisite for the implementation of the proposed framework, as well as the on-going actions to be taken by management for keeping up the effectiveness of the framework after implementation.

Actions Recommended As the Pre-requisite:

The recommended framework of KM performance measures is based on 'top 12' measures. 9 of these 12 factors are not accurately measurable or easily quantifiable, but have been identified in the field survey as very important. Even within these 9 factors, the ease of accurate assessment/ measurement is different. These 9 measures are given below in the descending order of their importance.

- Customer satisfaction
- CEO's personality/ leadership style
- Employee satisfaction
- Availability of a knowledge sharing/ dissemination mechanism
- Availability of company's stated 'vision'
- Availability of a Quality Management systems/ practices documentation
- Company's Image
- Reuse rate of existing knowledge/ best practices
- KM integration with strategy

Despite the inherent difficulty for accurate assessment of the above 'qualitative' factors, successful and leading companies in consulting sector have already installed some mechanisms for assessment/ quantification of above measures. For example, the illustrative case firms Tata Consultancy Services has put in operation a system for annual assessment of employee satisfaction on a measure Employee Satisfaction Index (ESI). Monitoring of such measures becomes more effective if the firms adopt formal mechanisms for assessments of these 'qualitative' factors.

Apart from the company's own efforts, independent third party agencies like trade associations, federations, independent business research groups and trade media can also play important role for coming out with periodic assessment / rating of various member firms on above measures. For example Dataquest – IDC India annual surveys have become commonly accepted 'benchmarks' on some of these measures like customer satisfaction, employee satisfaction etc. for IT consulting/ software sector. NASSCOM,

the apex body and umbrella organisation of the IT companies in India can play an important role for relative benchmarking/ assessment of their member firms, on above measures.

So as a prerequisite, the consulting firms have to put in place mechanisms for assessment/ quantification of the above measures to aid them in comparing their performance with the benchmarks. Wherever the managements feel, help of external organisations like NASSCOM, MAIT, etc can be taken for evolution of such mechanisms. In respect of firms from non-IT consulting, apex associations like Consultancy Development Centre (CDC) can be requested to assist. Other third party agencies like All India Management Association (AIMA), Business India Group, The Economic Times Research Bureau, etc can also be enlisted for such exercise.

With the above management recommendation, the consulting firms will be on a sound footing for actual implementation of the proposed framework.

Actions Recommended for Implementation:

After having established mechanisms for reasonably accurate assessment of the top 12 KM performance measures, the consulting firms have to decide on *two things* - a reference base for determination of its KMI value, and another benchmark for determination of KMP value.

For determination of Knowledge Management Intensity (KMI), the importance perception of the firm for each of the 12-KM measures is determined with reference to a base of comparison. This base can be consulting domain as a whole or the particular sector/ area of the firms operation. The framework presently recommended can be used directly for all IT consulting firms, as far as reference base is concerned. For firms in non- IT sectors too, the present framework provides the reference base for the consulting domain as a whole. However it is recommended that the reference base values should be decided for different consulting sectors like management consulting, engineering project consulting etc. This exercise is recommended to be done with the help of external

agencies like CDC, AIMA, Business India, The Economic Times Research Bureau or specialised trade associations for the sector of firm's operation.

Similarly, for determination of Knowledge Management Performance (KMP), the benchmark has to be decided by the company for comparison of its performance on 12 KM measures. For the illustrative case studies, the recommended framework used the benchmark as the company's own performance in previous periods. Though this benchmark serves useful purpose, it is recommended that the firms should put in place an effective " intelligence mechanism" for collecting the corresponding data on the key competitors and other associated organisations for monitoring its related performance with reference to the competition.

Finally, it is recommended that after successful working of the framework for 2-3 years, a review of the contents (list of which measures to be included for computation of KMPI value) is required - with reference to the base of KMI and also the benchmark decided for KMP. *With time there is a necessity for on-going review of the 'contents', although the 'concept' and 'structure' of the recommended framework will remain the same.*

6.4 Limitations of This Research

For the consulting firms, knowledge management can be a defining feature of their business and a serious competitive weapon. By virtue of the nature of their business, these firms see the capacity to compete on the basis of their accumulated knowledge and expertise. Precisely for the same reason, this research study faced some limitations. To start with, at the literature review stage there was *glaring inadequacy of published literature on KM implementation in consulting companies.* The other limitation faced was *the apprehensions voiced by the respondents during primary data collection.* Practically all the respondents had to be convinced about the commitment to the confidentiality of their individual responses. The sensitivity of this issue made it necessary to leave the option of giving the organisational profile information at the individual respondent's discretion. Despite this, as against a planned sample of 100, responses could be obtained

on the 'core data' from 108 respondents- *though some responses did not give the identification details of their firms.*

The confidentiality issue however, placed a limitation during comparative analysis of various data subsets out of the total data of 108 responses. For analysis of some data subsets, the number of clearly 'identifiable responses' turned out to be less then 30 and hence the treatment for 'small sample' size had to be given for these subsets, as compared to the data set as a whole or the bigger data subsets (like all firms from IT sector, all firms having a KM system or all Indian firms, etc.).

Another 'limitation' of this research relates to differing status of 'maturity level' of various organisations in knowledge management. The research was of course, bounded in scope to *consulting firms based in India.* At the field research stage however, a widely differing level of awareness, knowledge and maturity about knowledge management was encountered even within the bounded scope of research. Comparison of the two case firms given in Appendix D illustrates this point. Perhaps further research can also tackle the issue of widely different levels of KM maturity among Indian consulting firms.

6.5 Recommendations for Further Research

The current work forms the basis for monitoring and continuously improving the knowledge management performance of the consulting companies. Since the responses from IT consulting sector comprised a significantly large portion, all IT firms in India can directly benefit from this work. In addition, however the current study has the potential to initiate a stream of research for different specialised consulting sectors like management consulting, engineering project consulting, education consulting, health care consulting etc. Perhaps the awareness level and maturity about knowledge management will increase further among Indian consulting companies in the next 3-5 years. Hence further research on these different sectors will perhaps be more valuable after 3-5 years.

Another dimension for further research can be the KM maturity level itself. Some further research study can bring out a 'KMM Index' (Knowledge Management Maturity Index)

for Indian consulting companies, as a companion of KMPI brought out by the current research study.

Finally, further research is also recommended for a comprehensive longitudinal case study of an organisation which has implemented KM from scratch to see if the KM performance measures suggested in this research can be correlated with its current business strategy.

APPENDICES AND BIBLIOGRAPHY

Appendix A

Questionnaire for KM Performance Measurement

Part I Only one response from your company

Question 1: Does your company presently have Knowledge Management (KM) or similar activity?

[] Yes [] No [] Being put in place [] Not known

If 'No' or 'Not known', skip remaining part of question 1
If 'Yes' or 'Being put in place', then please continue

- Since when has KM (or similar) function been established in your organization?

  [] Less than 1 year [] Between 1-3 years [] 3-5 years [] Over 5 years

- Who is (or will be) heading the KM responsibilities?

  [] CEO [] CIO/IT Chief [] CKO [] Others (Please specify_____)

- Is KM a contributory element of business strategy/ corporate planning in your company?

  [] Yes [] No [] Not known

- Is there a system for ongoing review of the effectiveness of KM in your company?

  [] Yes [] No [] Not known

  If 'Yes', please describe briefly the same (say, 100-150 words) particularly indicating the major factors used by your company for evaluating the performance of KM programmes An idea about the implementation success of your KM system would particularly be useful for this research Any write-up on KM performance measures, if available, may be attached (Confidentiality is assured)

Question 2: Does your company have a mechanism for documentation and review of internal 'best practices' or ideas generated internally?

[] Yes [] No [] Not known

If 'Yes', please describe the mechanism briefly (20-25 words), mentioning any software system being used

_____

_____

Question 3: Does the performance appraisal system of your company incorporate any credit to employees for knowledge sharing, documentation, and peer referrals?

[] Yes [] No [] Not known

Organisational profile:

Area of operation: _____

Present revenue of your company (in Lakh Rs.) _____

Present IT investment (in Lakh Rs.): _____

No. of employees in your organisation:

[] 1-6 [] 6-30 [] 31-100 [] 101-250 [] 251-1000 [] 1001-3000 [] Above 3000

How old is your company?

[] Less than 1 year [] 1-3 Years [] 3-5 Years [] 5-10 years [] Over 10 years

Your Company's name (optional) _____

Questionnaire for KM Performance Measurement

Part II (One response per person; multiple responses encouraged from same organisation)

On a 4-point scale (4: Most important, 1. Least important) please give your rating about the ***importance*** of each of the *factors which may be considered for measuring KM effectiveness* Also for each of the factors, your perception about ***ease of measurement*** - on 4-point scale (4 Straightaway measurable, 1 Impossible to measure or quantify) may be given

Factors (and Units of measure) Examples ▪ Return on Investment ROI (%) ▪ CEO's personality/ leadership style	**Importance Rating** (4· Most Important; 1: Least Important) Example ratings ▪ 2 ▪ 4	**Measurement Ease Rating** (4. Directly measurable; 1. Impossible to measure) Example ratings ▪ 4 ▪ 1
Financial:		
Return on Investment ROI (%)		
Employee Value Added EVA (Rs.)		
Tobin's Q (Ratio of market value of firm over cost of replacing physical assets)		
Market/ Customer related:		
Market share (%)		
Annual revenue growth (%)		
New orders (No.)		
Av. orders per customer (No.)		
Ratio of repeat customers to total (Ratio)		
Customer satisfaction		
Av. expenses per unsuccessful bid (Rs)		
Success ratio for new bids (Ratio)		
Image		
Human/competency development:		
Av age of employees (Years)		
Av experience of employees (Years)		

New ideas of employees implemented (No.)		
Av. training imparted per year (Days)		
Training on KM practices (Days)		
Training/ competence development spending : Av. per employee (Rs.)		
Library investment per employee (Rs.)		
Seminars organised by company (No.)		
Total papers published per year (No.)		
Total no. of invited talks per year (No.)		
Patents held & pending (No.)		
Average age of patents held (Years)		
Av. amount of rework/rejects (%)		
Employee satisfaction		
Industry accreditation		
Certifications by industry/standards bodies		

Corporate leadership/strategy/practices

Availability of company's stated 'Vision'		
CEO's personality/ leadership style		
No. of executive levels in hierarchy		
No. of direct reports to CEO		
KM integration with strategy		
Duration of KM functioning (Years)		
Staff dedicated for KM function (No.)		
Availability of an employee experience recording mechanism		
Availability of a competency mapping mechanism		
Availability of a Quality Management systems/practices documentation		

Availability of a knowledge sharing/ dissemination mechanism		
Reuse rate of existing knowledge/ best practices (%)		
Time spent on project closing reports		
Time saved in creating new proposals		

Technological:

IT investments (Rs.)		
Communications investments (Rs.)		
R&D investments/ revenue (Ratio)		
Duration of Web-based functioning (Years)		
Availability of company wide collaborative/messaging/workflow tools		

Any other relevant factors which are not included above:

Respondent's profile:

Your age:

[] Less than 25 [] 25-35 [] 35-45 [] 45-55 [] Over 55

Your experience in completed years:

Total _____; In consulting/ advisory services_____ ; Others _____

Highest professional education:

[] Graduate [] Post-graduate [] Doctorate [] Others (specify)_____

Your Name & Designation (optional) _____

Your address for sending you the Executive Summary of this research study, if interested:

_____

E-mail: _____ Fax: _____

Appendix B

List of Sampled Firms
(in alphabetical order)

- Accenture
- Acumen Software Technologies Ltd.
- Allsoft India (P) Ltd.
- Arthur Anderson (Business Consulting)
- Blue Circle (India) Pvt. Ltd.
- CMC Ltd.
- DCM Data Systems Ltd
- Deloitte Touche Tomatshu
- Duncan Infotech Ltd.
- Educational Consultants India Ltd.
- Engineers India Ltd.
- Escolife IT Services (P) Ltd.
- First Health Services
- GlobeSpan India Pvt. Ltd.
- HCL technologies
- Hughes Escorts Communications Ltd.
- IBM Global Services India
- Infogain Corporation
- JIL Info. Tech. Ltd
- Kale Consultants Ltd.
- Legato Systems
- MECON Ltd.
- Microsoft Corporation
- Polaris Software Labs.
- PriceWaterhouseCoopers
- Sar Softech
- Software Alliance Inc.
- Software Technology Group
- Solix Technologies Ltd.
- STMicroelectronics
- Systems Logic India P. Ltd.
- Tata Consultancy Services
- Xansa India Ltd.

- Name withheld
  (These include leading firms like Infosys, Satyam, Wipro, Siemens, Hewitt Associates, Sun Microsystems, Tata Infotech, C-DOT, Motorola, Erricson, Baypackets, Cadence, Birlasoft, TechSpan, Shell e-Learning, Aarken Consultants, Newgen, etc. The respondents have requested that their firms' and their own identities not to be disclosed.)

Discussion Format for Case Study

Based on a field survey (of 108 respondents from 57 firms) already done, following 15 factors have emerged as the "'Top 15" determinants of KM effectiveness in a consulting company. For validation of this survey outcome, case study of some key companies like yours is being undertaken. You are requested to facilitate this research by giving your views/ information as following:

A. On a rating scale (continuous from 1 to 4, where 4 is 'Most important' and 1 is Not important at all) please indicate the ***importance*** your company perceives for each of the *factors which may be considered for measuring KM effectiveness*. The corresponding 'Mean rating' derived from the survey already done, is indicated for reference. (Your rating can be in fractions up to 2 decimals)

Mean Rating	Factor	Your Rating
3.60	Customer satisfaction	
3.42	CEO's personality/ leadership style	
3.43	Return on Investment ROI (%)	
3.42	Employee satisfaction	
3.37	Availability of a knowledge sharing/ dissemination mechanism	
3.32	Availability of company's stated 'Vision'	
3.31	Availability of a Quality Management systems/practices documentation	
3.27	Company's Image	
3.27	Reuse rate of existing knowledge/ best practices (%)	
3.26	KM integration with strategy	
3.24	Annual revenue growth (%)	
3.17	New orders (No.)	
3.20	Availability of company wide collaborative/messaging/workflow tools	
3.17	Annual IT investments/Revenue (Ratio)	
3.13	Ratio of repeat customers to total (Ratio)	

B. Out of above 15 factors, the following 5 factors are directly measurable/ quantifiable. To determine the progress of KM effectiveness over time in your own company, values for each of the factors may please be given for two consecutive years:

Factor/ Unit of measurement	Value for 2002- 03	Value for 2001- 02
Return on Investment ROI (%)		
Annual revenue growth (%)		
New orders (No.)		
Annual IT investments/Revenue (Ratio)		
Ratio of repeat customers to total (Ratio)		

C. The remaining 10 factors are not directly measurable/ quantifiable, but have been identified in the field survey as very important. To gauge the impact of these factors on KM effectiveness over time in your own company, please give your perception of whether each of these factors have improved or deteriorated in effectiveness over last year by giving "*change value*" relative to 1. (For example, change value 1.15 indicates 15% improvement of that factor over last year, change value 0.90 indicates slowdown by 10% for that factor over last year and value 1.0 means no change over last year)

Factor	**"*Change Value*" over last year** (1:No change)
Customer satisfaction	
CEO's personality/ leadership style	
Employee satisfaction	
Availability of a knowledge sharing/ dissemination mechanism	
Availability of company's stated 'Vision'	
Availability of a Quality Management systems/practices documentation	
Company's Image	
Reuse rate of existing knowledge of best practices	
KM integration with strategy	
Availability of company wide collaborative/messaging/workflow tools	

D. If a "Framework of KM Performance Evaluation" is given to your company, what would be your benchmarking targets for relative evaluation of your KM programmes? (Pl. tick all that apply)

[ ] Against your company itself, over previous year

[ ] Against your nearest competing firm
(Please specify the firm
_____)

[ ] Against averages representing your industry or sector
(Please specify the industry/ sector for benchmarking
_____)

[ ] Against averages across all industry/ sectors in consulting services domain

E. Organisational profile:

Industry/ sector of operation: _____

Revenue in 2002-03 _____

IT investment made in 2002-03 _____

No. of employees in your company:

[] 1-6 [] 6-30 [] 31-100 [] 101-250 [] 251-1000 [] 1001-3000 [] Above 3000

How old is your company?

[] Less than 1 year [] 1-3 Years [] 3-5 Years [] 5-10 years [] Over 10 years

Your Company's name _____ Web site _____

Your Name & Designation _____

E-mail: _____

Thank you for your support for this research!
My e-mail is csaoffice@vsnl.net

Background Information on Case Study Firms

1. Introduction

This appendix gives the background information about two of the four consulting firms studied for · illustration of the recommended framework of KM measures. The comparative analysis of the four firms is discussed in detail in Chapter 5. The background information given here pertains to the two companies as the 'study of contrast', so far as the KM practice in the firms is concerned. The first firm detailed here is Tata Consultancy Services (TCS) – India's first billion dollar IT consulting company in private sector and aspiring to be among the 'global top 10' by 2010, in league with the likes of McKinsey. The other firm studied in depth is RITES Ltd. - a leading consulting company in public sector with operational experience in India and abroad, in the transportation and infrastructure projects. *The information given here is restricted to only that aspects which have relevance to the KM practices*; and is taken mostly from the secondary sources- including the company literature, web-based resources, trade publications etc. The insights into the company KM practices - as obtained during interactions with the key resource persons from the respective companies during field research - of course, also formed important supplementary inputs for the case studies.

2. Tata Consultancy Services

Tata Consultancy Services (TCS) is a division of Tata Sons, the holding company of the $10.4 billion Tata Group, one of India's top business conglomerates. As the first technology company from India crossing $ 1 billions in revenue (total revenues of Rs 5,012 crore - $ 1.04 billion - in the year ended March 31, 2003), it is today Asia's largest IT consulting /Software services firm. From its beginning in 1968 to its present position of dominance in IT consulting, TCS today has around 24,000 employees servicing clients in over 55 countries around the world. With over 100 branches globally, TCS has been the largest exporter of software services and can be viewed as a truly transnational consulting firm in its character and reach.

TCS's industry offerings are structured into following 10 industry practices.

1. Banking
2. Financial services
3. Insurance
4. Telecom
5. Manufacturing
6. Retail
7. Transportation
8. Healthcare and life sciences
9. Energy & Utilities
10. s-Governance

In addition to the above industry practices, TCS also maintains an in-depth knowledge of various technology areas enabling it to provide end-to-end solutions and services. These technology areas are organised into 8 service practices as follows:

1. eBusiness
2. Application development and maintenance
3. Architecture and technology consulting
4. Engineering services
5. eSecurity
6. Large projects
7. Infrastructure development and management
8. Quality consulting

There are several key differentiators, which make TCS as the leader of IT consulting firms. For instance, it has an effective business model supporting onsite, offshore and offsite delivery, a record of significant experience and successes in large IT projects execution and the strong R&D focus to provide asset leveraged solutions. With a *formally*

stated vision to be among the global top 10 by 2010 employing 30,000+ professionals in 2010, TCS has initiated a comprehensive framework 'TBEM' - Tata Business Excellence Model – for its company operations. This framework TBEM, patterned on the lines of Malcolm Balridge National Quality Award, instituted by the National Institute of Standards and Technology, USA aims to spur individual excellence to achieve organisational excellence. The company has circulated a list of following 11 'core values' to all its employees as the foundation for integrating key business requirements into excellence of business results. These 11 core values are:

1. Management by facts
2. Systems perspective
3. Managing for innovation
4. Visionary leadership
5. Focus on results
6. Organisational and personal learning
7. Agility
8. Consumer driven excellence
9. Social responsibility and citizenship
10. Focus on future
11. Valuing employees and partners

TBEM is being adopted in TCS as a mandate from the Chairman of the Tata Group of companies. A booklet on adoption of TBEM had been widely circulated by the CEO of TCS for implementation. This booklet had listed seven broad categories in the TBEM criteria to assess the company as a whole and its various business units. These categories along with the associated weightages in point values are given in Table D.1:

Table D.1: TBEM Categories Used by TCS

Sl. No.	Category	Weightage Points
1	Leadership	125
2	Strategic Planning	85
3	Customer & Market Focus	85
4	Information & Analysis	85
5	Human Resource Focus	85
6	Process Management	85
7	Business Results	450
	Total	**1000**

55% of the points in the criteria focus on *how the organisation is run*; the remaining 45% of the points focus on the *results achieved.* Categories 1 through 6 (550 points) focus on company's approaches or systems. The criteria do not tell the best method for running the business. Rather, they look for evidence of a systematic approach that is tailored to the needs of company's business and culture. Category 7, *Business results, asks about financial, customer and employee satisfaction performance.* All important results in running a business are assessed in TBEM.

For measurement of organisational performance, TCS has put in place a well-balanced set of measures. These include short-term measures such as operational and financial metrics as well as long term measures such as *customer satisfaction, market growth and employee satisfaction.* 45% of the points relate to these 3 measures of performance. TCS uses the concept of Balanced Scorecard (BSC) for integration of its performance measures and for aligning the entire organisation to achieve its stated vision. This approach deploys the set of performance measures decided through TBEM and a 'dashboard of metrics' is finalised. This dashboard of metrics includes all perspectives of the business like financial, customer, internal business processes and learning and growth.

TCS has installed an in-house system 'eKMS' for its knowledge management processes. Access to this system is restricted on the company's Intranet for its select senior functionaries only, for guarding the proprietary information being built up in a common repository. The objective of creating the common Knowledge Repository is to gather all technical and business related information (knowledge assets) at a single place and organise it in such a way that it can be easily access by anyone. This knowledge repository consists of the following illustrative contents:

- Strategy documents, SpreadSheets
- Proposals
- Reusable software components, proof of concepts
- Tools, Downloaded Products, Utilities, White papers
- FAQs, Questionnaires
- Estimation sheets
- Presentations, Documents, Spreadsheets
- Methodology
- Useful URLs

Now, the standing of TCS in respect of the major KM aspects considered in the framework recommended by this research, is reviewed.

Customer Satisfaction

In a survey conducted by Dataquest-IDC India among 307 CIOs on customer satisfaction, reported in Jan 15, 2003 issue of *Dataquest,* TCS scored 77 points out of 100 - for the software services sector - against the industry average of 69 points. Though TCS stands at number 1 rank for IT services, CIOs were not very satisfied with the quality of service expected. That speaks of the possibilities for improvement.

CEO's personality/ leadership

Mr. S. Ramadorai, the CEO of TCS since 1996 has played a stellar role in the growth of the company, and his efforts have helped make it one of the world's leading software and services enterprises. Ramadorai has guided this company to cross the magic US$ 1 billion mark in revenues, making it the first Indian IT services company to achieve this landmark. He has played a significant role in building TCS in attaining its current global reputation. His vision for the future includes establishing TCS as one of the world's top ten software companies.

Ramadorai's relationship with TCS started much before 1996. He started out as a junior engineer and was later entrusted with the task of setting up and developing the important TCS base in the United States in 1979 in New York City. The TCS-US network now boasts of 40 offices in strategic locations.

Ramadorai's vision is evident from the active role he played in establishing offshore development centres (ODCs) in India to provide high-end quality solutions to major corporations. With a view to keep pace with changing technologies at all times, Ramadorai set up technology excellence centres in India that have acquired knowledge, expertise and equipment in specialised technology areas.

Ramadorai's key initiatives include his relentless pursuit of excellence in quality, taking fifteen of TCS's development centres in India to SEI's CMM Level 5, the highest and most prestigious performance assessment issued by the Software Engineering Institute (SEI). TCS also attained the impressive distinction of being the world's first company to have four centres assessed as operating at Level 4 of PCMM (People-CMM).

Ramadorai is one of the few Tata professionals to have been appointed to the boards of non-Tata companies, including Hindustan Lever Limited and Nicholas Piramal. As CEO risen from ranks, Ramadorai has demonstrated his acceptability of all employees.

Employee Satisfaction

Since 2001, TCS has put in place a system for measurement of employee satisfaction index, based on the survey of all employees on an ongoing basis. Employees give their ratings anonymously on various parameters. The satisfaction score has been increasing from 65.37% in 2001 to 71.45% in 2003. The areas needing improvements are conveyed to the concerned managers including those from support groups.

Surveys are also being done by external source agencies. In a study done by Hewitt Associates in 2003 for identification of "the best employers in India", TCS comes at the 10^{th} position out of 220 organisations who participated in the study. The outcome of this study pointed out certain positive indicators in the top organisations. These include a lower attrition rate, attracting higher quality of potential employees, higer morale levels, pride to be associated with the organisation and a healthy impact on the bottom line.

In another survey conducted by Dataquest-IDC India in 2003 for identification of Indian IT sector's best employers, TCS scores at the 2^{nd} rank as the employer – based on a composite feedback from HR managers, as well as the employees. From HR, the parameters for assessment included attrition rate, retention rate etc. However in terms of the satisfaction ratings sought from the concerned employees, TCS ranking is relatively low at number 13 - on the parameters like company culture, job contents and carrier growth. This gives some alarming signals for a company ranked as number 2 employer. TCS perhaps need to guard against the factory approach in handling of its employees

Availability of company's stated vision

TCS has very clearly formulated and communicated its vision to all its employees and other stakeholders. This vision to be among the global top 10 by 2010, drives the business model of the company following the Balanced Scorecard approach for its performance measurement.

Company's Image

TCS has been maintaining its *numero uno* rank as the top company in IT consulting/services sector in Asia. Having multiple SEI CMM Level 5 centres, a range of world-class products, proven offshore development capabilities, and various industry and government awards only enhance further its image.

Availability of various KM facilitating mechanisms

The company has been running an internal review system for its KM activities through 'eKMS'. Though the details are not disclosed by the company, it is understood to have reasonably effective mechanism for knowledge sharing and dissemination, collaborative/ messaging/workflow tools in place and established system for quality management documentation. KM is an integral part of its business strategy as the performance measures of TBEM frame work include major KM performance measures, which form a part of the framework recommended by this research work.

Annual Revenue Growth

Though TCS has been showing increasing revenues the growth rate has suffered significantly in the last year. The company registered 20.3 % growth in 2002-03 against a higher growth rate of 28.7 % in the previous year. Though the slow down of the IT sector in general may justify this, TCS needs to guard against being complacent as the leader of the IT consulting segment. This gets reflected as a KM performance measure in the proposed framework.

In a nutshell, TCS emerges as a relatively good performer in its knowledge management activities. Most of the top 12 measures of KM performance speak well about the effectiveness of the company's KM performance. The illustrative high value of Knowledge Management Performance Index, KMPI (= 8.01) is consistent with the performance of TCS demonstrated on KM aspects. However whether TCS can come in the same league as McKinsey and compete with it? Prof. Robert Kennedy – who has developed a case study on TCS for Harvard Business School – voiced pessimism on this.

He feels that TCS should stick to its niche area of IT consulting rather than business consulting or products to maintain its leadership[1].

3. RITES Ltd.

RITES, a Government of India Enterprise was established in 1974, under the aegis of Indian Railways. An ISO 9001 company, it provides comprehensive consultancy services and transfer of technology to client organizations in the following sectors:

- Railways
- Airports
- Waterways & Water resources
- Urban Transport
- Highways
- Information Technology
- Ports and Harbours
- Urban Development
- Marine Engineering
- Packaged export of rolling stock & spares
- Ropeways

RITES is internationally recognized as a leading consultant with operational experience of over 60 countries in Africa, South East Asia, Middle East and Latin America. Most of RITES foreign assignments are for National Governments and other apex organizations. Presently, RITES has more than 35 on-going projects in 13 countries worldwide.

[1] Source: "They don't believe TCS can compete with McKinsey", *The Economic Times*, 28 February, 2003

In India, the clients range from State Governments, Public Sector Undertakings and Corporations to industrial establishments and private enterprises. RITES is registered with international funding organizations such as:

- World Bank
- Asian Development Bank
- African Development Bank
- United Nations Office for Project Services (UNOPS)
- United Nations Industrial Development Organization
- United Nations development Programme
- Kuwait Fund for Arab Economic Development

The range of consulting services provided by RITES includes:

- Pre-Project planning involving project identification, feasibility studies and project appraisal
- Project support activities comprising surveys, environmental & social impact assessment, geo-technical and other investigations
- Project preparation activities of detailed engineering, design, tender documentation, bid evaluation
- Project implementation/management covering contract administration, field engineering and construction supervision, procurement services, product certification, quality assurance.
- Commissioning, operation, maintenance of rolling stock & workshop managment.
- Training, Quality assurance & management
- Multimodal Transport studies & materials management
- Financial, business plan, privatisation & concessioning
- Property development
- System Engineering
- Economic & financial evaluation

RITES employs over 1000 specialists of professional standing in the fields of engineering, management and planning. Besides full time professionals, RITES has on its panel a large number of experts, whose services can be drawn upon at short notice. This provides the company a cost-effective and flexible human resources option for meeting the needs of clients worldwide. It's headed by a Managing Director & CEO appointed by the Government of India.

RITES has sustained its revenue growth and profitability since inception. However the revenue *growth rate* fell drastically in 2002-03. After recording an impressive performance during the financial year 2001 – 2002 (rise in income from Rs. 180.75 crore to Rs 283.37 crore), the 2002-03 income rose at a much slower rate, to Rs. 321.51 crore. In fact, for the year 2001-2002, RITES had been adjudged "excellent" - the highest level of rating under the Memorandum of Understanding (MOU) signed with the Ministry of Railways and the company was granted the status of 'Mini Ratna' in 2002.

Now, the standing of RITES in respect of the major KM aspects considered in the framework recommended by this research, is reviewed.

Customer Satisfaction

Though RITES has earned a string of awards and recognition from Government - including last year's granting of the status of Mini Ratna – and from various export associations, most of these relate to higher levels of financial achievements, The company has no system in place to assess and measure customer satisfaction. Interactions with senior persons however reveal that RITES gives significant importance to this measure – 3.9 compared to 3.6 for the consulting domain as a whole.

CEO's Personality/ Leadership

Government of India appoints CEO/MD of RITES on the recommendations by Public Sector Enterprises Selection Board. In terms of autonomy of selection of key personnel as well as major business strategies, CEO's leeway is rather limited, as compared to private

sector firms like TCS. However the this aspect as a KM performance measure definitely gets perceptible, if benchmarked over previous year's performance as the benchmark.

Employee Satisfaction

Though the firm sees the importance of this measure as quite high - 3.5 compared to 3.42 for the overall consulting domain –the company has no system in place to assess or measure this. Perceptually however, employee satisfaction is reported to have gone up by 10% over last year.

Availability of company stated vision

There is no formally documented vision statement – either given in the annual report 2002-03 or on the company's web site. However the web site mention the following as the 'corporate philosophy' of RITES:

- *To deliver quality despite all odds.*
- *Deliver results on time.*
- *To employ local consultants and expertise as an effective instrument of transfer of technology.*

The annual report mentions company's 'mission' as follows:

"To be one of the most admired companies, in India and abroad, rendering state-of-the-art consultancy, engineering and project management services, in the field of transportation, infrastructure and related technologies.

The company would aim at leadership in every business by synergizing values, integrity, and drive for technology and innovative spirits, ensuring value for money, to its clients and benefits to society, at large"

Evidently the clarity of vision and the availability to all employees is lacking. Though the company attaches rather high importance to this aspect (3.5 as against 3.32 for the overall consulting domain), the company needs to improve on this aspect.

Company's Image

RITES has a good image as a public sector 'Mini Ratna' organisation, as well as various awards in the past. The company attaches quite high importance to its image (3.6 as against 3.27 for the consulting domain as whole).

Availability of various KM facilitating mechanisms

On the aspects related to KM practices and implementation, RITES scores rather poor compared to firms like TCS. RITES does not have a formal Knowledge Management function working in the organisation - even though it has the practice of project documentation as a part of its functioning. Obviously KM does not figure as a contributory element of its business strategy/ corporate planning. There is no system for review of KM practices, because the KM system does not itself exist. Interestingly, during case study interactions RITES indicated a very high importance to integeration of KM with strategy (3.8 as against 3.26 for the consulting domain as a whole). This reinforces the need for putting in place a formal KM performance framework, as recommended in this research.

Annual revenue growth

It is here that RITES has suffered heavily on its performance with reference to last year benchmark of its own performance. As indicated earlier, despite the growth in income from 2001-02 to 2002-03, the *growth rate* fell drastically from 56.77% to 13.46%. From the viewpoint of consulting operations as a whole, the sustenance and growth of the growth rate itself is an important indicator of KM performance. So despite the good overall financial performance, the company has to introspect on this issue and to isolate any aberrations in performance from the normal trend.

In a nutshell, despite the good financial performance and the company image, RITES has not tapped its potential further through sound KM practices. Though it attaches quite good importance to the top 12 KM measures (KMI of RITES is 1.57), the KMPI value for RITES comes out to just 0.62. Apart from the significant drop in the growth rate, the company has to put in place working system for assessment/ measurement of customer

satisfaction, employee satisfaction etc and also to integrate KM into its business strategy. Only after these initial steps, RITES can adopt the recommended framework of this research.

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